2014

The influence of personal and educational demographic factors on the productivity of farmers in selected geographic regions of the Ukraine

Viacheslav L. Sereda
Louisiana State University and Agricultural and Mechanical College

THE INFLUENCE OF PERSONAL AND EDUCATIONAL DEMOGRAPHIC FACTORS ON THE PRODUCTIVITY OF FARMERS IN SELECTED GEOGRAPHIC REGIONS OF THE UKRAINE

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Human Resource Education
And Workforce Development

by
Viacheslav Sereda
B. S. Ukrainian Agrarian University, 1995
M.S. Louisiana State University, 1998
August 2014

I dedicate my dissertation work to my family, including my wife Olga Sereda, my son Nicholas Sereda, my daughter Maria Sereda and of course to my parents, Leonid and Ludmila Sereda. My family provided their tremendous support and created learning environment which inspire me to achieve the highest degree in the United States. I had a lot of challenges during my learning experience. The most difficult challenge for me was to overcome my language barrier. Writing and thinking in English language were most challenging tasks during my doctoral program at the Louisiana State University. Therefore support of my family always helped me to overcome any difficulties and encourage me to achieve my educational goal. I am so grateful for their support and most of all for believing in me.

I also would like to dedicate this dissertation to my brother, Pavel L. Sereda. Unfortunately he left us too soon but he always stays in my memory as a cheerful person that always was able to find a way to help people that surrounded him. No matter how hard it was for me to study during my program, his cheerful image helped me to keep going. I will always keep You in my memory.

ACKNOWLEDGEMENTS

My educational pathway was not that easy how I would like to be and from time to time I wanted to give up my goal. Therefore, all people that helped me during my educational program made my goal achievable and kept me to believe into my abilities. I will always remember their dedication and tireless effort to help not just me but all students that enrolled into the School of Human Resource Education And Workforce Development.

I cannot express in the small paragraph all of my highest appreciation for Dr. Michael Burnett, my major professor. His knowledge, expertise and support made me work so hard to accomplish my major goal. He inspired me to finish my work and he always understood all issues that I had to deal during my academic program. During my program, we became a lifetime friends and without this friendship I would probably never have been successful to achieve my degree. He believed in me, in my learning abilities and most of all he always guided me through the difficult time during my program. I hope we will continue our friendship no matter which path we will go after my graduation. Again, big thanks to Dr. Burnett for all what he has done for me.

I also would like to express my appreciation to my co-chairman, Dr. Satish Verma. His deep knowledge of conducting research and research design and ability to transfer his knowledge to his student, dramatically helped me during my program. His expertise in international extension models and research design helped and guided me during my doctoral program. I always will remember his big contribution and assistance during my program.

Dr. Earl Johnson, my third committee member showed his the highest dedication to help students to achieve their goals. It is very important to mention about Dr. Johnson dedication to his work and help students to be successful in their program. His knowledge in philosophy and

experience in extension research taught me to make right decisions about my research tools and research design.

My dippiest appreciation goes to my Graduate School representative, Dr. Gail Cramer. His knowledge in agricultural economics inspired me to continue to do my research even after completion of my program.

Besides members of my committee, I would like to acknowledge all people who worked at the USAID Project between Louisiana Agricultural Center and Ukrainian partners including World Laboratory, Ukraine Branch, Vinnitsa State Agricultural University and Project Center. They tirelessly worked on data collection process and always quickly response on any issues that came out during data cleaning process made data collection and analyzing process very easy.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

The primary purpose of this study was to determine Ukrainian farmers characteristics based on demographic information, describe their agricultural production, land ownership, best farming practices and determine factors that could influence farmers' gross income. Of the tree Oblasts selected, a total of 250 farmers were randomly selected in two of the oblasts and 150 in the other (due to the size of the population in the smaller sample) for personal interviews by the raion specialists. Random samples were drawn from these lists using a computerized random numbers table. Survey was designed to collect necessary information. Raion specialists received one-day training session to learn personal interview techniques.

Overall, most of the farmers, (approximately 84%) indicated to have a degree of technical college or above. The average age of farmers was 45.8 which approximately 11 years younger than farmers age in the United States. Also, this study found that most of the farmers - (545), received their land from the village council title and use farming as their major source of family income. However, only 25% of farmers indicated receiving financial credit for agricultural production. The major reason for not applying for financial credit was "high interest rate".

Also this research concluded that size of agricultural land was the most influential factor on Ukrainian farmers' gross income which correlates with high amount of black soil in Ukraine that requires less agricultural inputs for the high crop production.

Based on the research findings the researcher concluded that Ukrainian government should developed programs to improve credit accessibility with reducing annual interest rate, establish farmers' credit unions and also develop legislation for governmental crop insurance program similar to the Catastrophic Coverage (CAT) Act that was passed in U.S. in 1994. Also, most of the participating farmers had mixed crop-livestock farming. This type of

agricultural production made it very difficult to calculate specific crop gross income per hectare due to combined collected information about agricultural inputs. Further research needs to be done with more detailed information about inputs or with population of farmers with narrow crop or livestock production to be able to determine optimum size of owned or leased land.

CHAPTER 1.
INTRODUCTION

Rationale

After the breakup of the Soviet Union, the newly independent Eastern European countries were placed in the position that they had to adjust to free market rules. One of the areas where this adjustment was most critical was agriculture. Therefore, the Ukraine began efforts designed to make the critical reforms in agriculture. According to the United Nation Land Administration Guidelines (1996), one of the first and most important steps in the transition from a central governmentally controlled system of agriculture to a market economy is the establishment of private ownership of land. Prior to 1992 all agricultural lands (except for small household plots) in the Ukraine had belonged to the government in the form of state and collective farms. In 1991, the Ukrainian Parliament adopted the Land Code Decree referred to as "About Land Reforms." That was the beginning of land reforms in the Ukraine. In October 2001, the Ukrainian Parliament adopted a new Land Code which provides the "Right to Land" in Chapter III, Article 78 (Bondar A & Lilje B., 2002). This Article indicated that land in the Ukraine can be in private, communal and state ownership. Over eight million hectares of land have been privatized, with plots averaging five hectares.

Through this land reform in the agricultural sector, the land that had previously been in state and collective farms was divided among the people who had previously worked for/on the state and collective farms. Each of these individuals received a portion of the land for their personal ownership. In addition, the agricultural equipment that had been used on the state/collective farms was divided among the former workers. This equipment had previously belonged to the government. These people had a choice to use their newly acquired land in essentially one of two ways. They could either lease their land to someone else that wanted to

farm the land or they could become private farmers. Most of the people had very limited experience regarding how to produce agricultural products. Virtually all of this experience had been on their home plots which meant that it was only on a very small scale. For many of the former farm workers, this limited experience made their decision about whether or not to become a farmer very easy. They did not feel prepared to face the different challenges associated with moving from being a small scale producer into being a farmer on a much larger scale.

Previously, collective farms used a centralized decision making structure which removed agricultural producers from the decision making position on the farm. However, after new farmers received their agricultural land and were faced with farm operational and decision making challenges, it became necessary to establish farmers' educational programs similar to outreach programs in the U.S. extension service and also to determine major factors that will influence farmers productivity.

A three-year extension education project intended to improve agricultural production of small private farmers in three oblasts – Cherkasy, Khmelnytsky, and Vinnytsya - in Ukraine began on March 1, 2002 and ended on February 28, 2005. Funded by the US Agency for International Development (USAID), the Louisiana State University Agricultural Center (LSU AgCenter), as Project contractor, partnered with the World Laboratory, Ukraine Branch, Kiev and state agricultural universities/academies in the three oblasts to organize, plan, conduct, and evaluate education programs targeting private farmers.

Organized through a state agricultural university/academy in each oblast, the Project covered 67 raions (counties) and involved approximately 3,500 private farmers. Selected university/academy faculty possessing advanced degrees in different agricultural disciplines and raion specialists (county agents) with a basic agricultural degree were recruited and trained in

extension program development and adult education methods. At the end of the Project evaluation data was collected to describe farmers' profile and to measure the impact of educational programs on Ukrainian farmers' productivity.

Purpose of Study

The purpose of this study was to use evaluation data from the Ukrainian-American Extension Project to describe Ukrainian farmers' demographic characteristics, farming experience and management skill, farming production characteristics and agricultural products marketing methods. In addition, the study determined different factors that could impact farming productivity and determine major factors that impact the farming gross income from agricultural production of crops and livestock.

Specific Objectives

The following specific objectives were developed to help in accomplishing the purpose of the study.

1: Describe private farmers in selected oblasts in Ukraine on the following personal attributes and agricultural operations: age, gender, educational level, household composition, occupation and income, organizational affiliations, length of time in private farming, acquisition and area of private farming land and other farm assets.

2: Describe agricultural production and marketing characteristics of Private Farmers in Selected Oblasts in Ukraine.

3: Use Multiple Regression analysis to determine major factors that impacting agricultural production of Ukrainian Farmers in selected three Oblasts.

CHAPTER 2.
REVIEW OF RELATED LITERATURE

Introduction

Agricultural production became a very important issue in the 21st century. With dramatic growth of the world population, agricultural production has become one of the most important issues of our time. Specifically, importance of sustainable agriculture is one of the major factors in low-income countries or countries with a developing economy. The World Bank's Report, *Agriculture for Development* (2008) reflects on a major concern about worsening food insecurity and vulnerability to poverty. Our world population increased to almost nine billion in less than 30 years, therefore it became very important to understand the question of how we provide necessary daily meals for all of these people. To address food insecurity concerns, many organizations and agricultural entities within international agricultural development and extension service are working on the research not only for improving the agricultural production of farmers on established agricultural crops but also providing assistance for improving agricultural production in countries with a developing economy. A paper published by the Department for International Development (Annual Report, 2004) provided reflection on the history of agricultural development and the close relationship between different rates of poverty reduction over past 40 years and differences in agricultural performance – mostly the proportion of growth of agricultural productivity. The authors emphasized the relationship between agriculture and poverty reduction as being reflected through four 'transmission mechanisms':

1) Influence of improved agricultural productivity on rural incomes;
2) Influence of price reduced food for the different type of population including rural and urban;
3) Agriculture's role for developing and impacting the non-farm sector;

4) Agriculture's major impact in improving and making sustainable economic transition during period of countries moving away from being only or primarily agricultural towards a much wider base of manufacturing and services.

Agricultural production and poverty

Additional research suggested that agricultural productivity growth is much more effective to reduce population poverty than improve other sectors for poverty reduction. Researchers provided two major factors listed below to explain reducing poverty through improvement of agricultural productivity:

1) Incidence of poverty tends to be higher in agricultural and rural populations than elsewhere, and

2) Most of the poor live in rural areas and a large share of them depend on agriculture for a living (World Bank, 2008; Christiaensen and Demery, 2007; Ravallion and Chen, 2007). Therefore, if we will take into consideration a fact that poverty is lower within the population of non-farm people (whether rural or urban), growth in income from non-farm sources could be as much or more effective in reducing poverty. In addition to that, poor farmers' families could benefit even more from non-farm sources of income which will positively effect on their and their family socio-economic status. Previously completed research leads to the major conclusion that developing agriculture is critical for economic development of any country in the world and even more crucial for countries with a developing economy. Therefore, it is very important to focus on sustainable agricultural development.

Due to dramatic increase of the world population and the issue of securing enough food production without a major impact on world environmental concerns, international agricultural research and extension are working to change focus on the sustainable development of the small-

scale farmer. A sustainable development is one of the most important quality of life issues while improving productivity. It encourages conservation of natural resources while presenting economically enhanced solutions to secure enough food production, and must be maintained by the farmers' community. Agricultural development organizations must, therefore, focus not only on increasing productivity among farmers in developed countries but also involve some of the poorest farmers in the world in sustainable agricultural development (Chambers 1983).

Programs and services and their influence on agricultural production

Based on experience of developed countries with a strong agriculture, an extension service plays a critical role for developing sustainable agriculture. The services provided by extension service have significant impact on public-good attributes. However, there are at least 800,000 official extension workers around the globe, and most of the world's extension services, approximately eighty percent, are publicly-funded and delivered by civil servants (Feder, Willett & Zijp, 2001). Different governmental and non-governmental entities including universities, autonomous public organizations, and NGOs providing approximately 12% of extension services and the additional 5% is delivered by the private sector.

It is also very important to emphasize additional benefits from investment in extension services or the facilitation of nongovernment extension. The nongovernment extension approach could also play a critical role and provide important tools for improving agricultural productivity and increasing farmers' incomes. More than 90% of the world's extension personnel are placed in developing countries (Umali & Schwartz, 1994), where indeed the majority of the world's farmers are located. Therefore, researchers are still debating about clear extension impact on farm performance.

An extension service helps to improve agricultural production and decrease the differential between potential and actual yields in farmers' fields by accelerating technology transfer and helping farmers become better farm managers. It also has an important role to play in helping to implement new research in agricultural farmers' fields. The extension service is playing a major role to build bridges between scientists and farmers: it facilitates both the adoption of technology and the adaption of technology to local specific conditions (World Bank., 2010).

Therefore, it is vital to understand major factors that could play a critical role in increasing farmers' productivity. Each country has specific and unique agriculture, and some of the factors could vary from country to country. It is very important to understand factors that impact profitability of agricultural systems. Many factors play into farmers' decisions, including restrictions with respect to available production technologies, biophysical or geophysical restrictions, labor and input market restrictions, financial and credit restrictions, social norms, policy restrictions, and restrictions to knowledge or skills (Stroorvogel et al., 2004).

Research has been done to understand technology adoption at the farm level. Most of the findings of those studies indicated that variables influencing production may include farmers' attitudes, resource availability, education and knowledge of farming, and ability to adopt new agricultural practices. (McCann 1997, Hanson et al., 2004). A farmer's income or resource base and ability to obtain credit will also influence the crop selection process, farming systems and willingness to invest in new crops, systems, technology, or agricultural inputs (McCann 1997, Knowler and Bradshaw 2007). Biological and geophysical factors and availability of agricultural inputs and outputs on the market are important variables that also influence farmer

decision-making and adoption of land use practices or technologies. Biological and geophysical factors that influence agricultural production could include:

- Available water for farming;
- Soil fertility;
- Risk involved in farming (flooding, drought, frost, hurricanes, etc);
- Pest or weed infestations;
- Availability of agricultural inputs

All of those factors listed above can play a major role on farming income (Loomis et al., 1971, Leemans and Born 1994). Some of the researchers indicated land accessibility and location also as important factors in influencing farmers' profitability. Rogers (2003) indicated that communities closer to urban centers are likely to adopt new technologies more quickly.

Finally, governmental policies and regulations can impact the profitability of agricultural producers. Governments could facilitate or obstruct trade in particular types of agricultural products, by influencing decisions about what crops to grow or how much land to farm using policies such as price supports or set-aside programs, or by making different types of production land-use relatively more or less "expensive" via regulations, taxes and subsidies. (Hardie et al., 2004, Goets and Zilberman 2007). A good example of governmental policy could be found in federal programs such as the Conservation Reserve Program (CRP) and Environmental Quality Incentive Program in the U.S., payments provided as part of Rural Farming Contracts in France, the 1999 Basic Law of Food Agriculture and Rural Areas in Japan (Smith 2006), the Grain-for-Green program in China (Uchida et al., 2009), and Costa Rica's PES programs for carbon sequestration via forestry, forest conservation, and agroforestry (Montagnini and Nair 2004). Government policies could dramatically impact the rate of agricultural productivity in both the

short run and in the long run (Fuglie et al., 2007). However, Fuglie emphasized the importance of policies that affect the long run rate of productivity growth of the agricultural sector. These include macro-economic policies that encourage new investment and policies that encourage agricultural research and innovation.

Eastern Europe and Agricultural Changes

Similar impact of the governmental policies could be found in Eastern European countries as well. One of the first countries in the reforming of agriculture was Poland. Reforms started in 1989 that included price and free marketing directions (including subsidy cuts), privatization and land reform, and farm restructuring. Prior to 1989, most of the Poland's agriculture had a centralized structure based on collective farms (Macours and Swinnen 1997). It was typical structure of agricultural production across post-Soviet States and neighboring countries. Prices, agricultural crops and marketing were determined and enforced by the government, often driven by a political agenda rather than economic objectives and causing inefficiencies in agricultural production, consumption and marketing patterns. After moving to the market oriented economy, removing governmental subsidy, consumer prices dramatically increased, real incomes often declined, and domestic demand substantially decreased. In addition, foreign market access had been reduced as the traditional agricultural export markets in the former Soviet Union experienced problems with the lack of hard currency. At the same time inputs prices for agriculture increased strongly relative to producer prices. Therefore, replacing a centralized agricultural system by a private farming system played a critical role in increasing agricultural productivity. The change of agricultural production from collective farms to individual farms is, therefore, expected to increase the incentives for labor effort. Individuals will increase their labor efforts, as their income will now be directly related to the performance

of the farms. This causes an increase in the productivity of the labor hours as well as in the intensity with which the other inputs are used (Carter, 1984). For this reason, the break-up of collective and state farms into individually managed farms ("decollectivization") is expected to have a positive effect on output. Decollectivization had a considerable impact on technical efficiency in China (Mc Millan et al., 1989; Lin, 1992). Similar decollectivization has been implemented in Poland and neighboring countries such as Romania, Slovakia, Slovenia and Ukraine as well.

The Ukrainian agrarian sector went through a lot of changes during the last decade. Changing collective farms into private farming forced the Ukrainian government to change land ownership as well. By December 2000, Ukrainian government issued the Land Privatization Decree stipulating that land shares had to be transformed into private land plots with well-defined physical boundaries (Keyzer et al., 2012). Those changes eliminated collective farms and their assets were distributed among new agricultural producers. A variety of new production entities emerged including limited liability companies, private farms, agricultural production cooperatives, open and close joint stock companies, and household plots. Corporate farms include various organizational and legal entities established in accordance with the legislation of the Ukraine: state-owned enterprises, private enterprises, economic partnerships, production cooperatives and other. Individual farms included two major categories: private farms and household plot owners. In 2010 there were 41,700 private farmers and approximately 9.4 million household owners (Statistical Yearbook 2010). During the land ownership transition period, agricultural production decreased. For example, total grain production declined from 51 million tons in 1990 to 25 million tons in 2000 (Mishcenko and Gumeniuk 2006). At the same time

prices on major inputs dramatically increased, specifically on the fuel needed to operate farm equipment, which negatively impacted on farmers' profits.

After a decade of economic and structural changes, there is still an urgent need in Ukraine for comprehensive agricultural rural development strategies, and effective institutional transformation for sustainable agricultural rural development. While economic conditions for agriculture have changed considerably since the beginning of the 1990s, agricultural policy in the Ukraine was focused on trying to retrieve the production level without the comprehensive analysis of internal and external markets, farming infrastructure and available access for agricultural inputs (Mishcenko and Gumeniuk 2006).

Factors Influencing Agricultural Productivity

One of the factors that could impact farmers' productivity is land size. Most of the studies of the relationship between size of the agricultural land and productivity are based on the basic neoclassical model. The farm productivity could be described as Y=F(A, L, K), where A is characteristics of agricultural land, L is the set of labor characteristics, and K is the capital used for inputs (Teryomenko 2008).

Mazumdar (1965) was one of the first researchers who analyzed the relationships between size of agricultural land and farmers' productivity. His research was done in Uttar Pradesh (India) during 1955-1956. He discovered that with the increase of agricultural land size on farm, its productivity decreased. Mazumdar analyzed the relationship between farm size and productivity by the fact that family labor is used for cropping on small farms and hired labor is used on the large farms.

Bhalla and Roy (1988) suggested that the inverse relationship comes from the unobserved difference in land fertility. They argued that in developing countries, once the land quality

variable is accounted for, the inverse relationship is observed to weaken, and many cases disappear. Sampath (1992) conducted research on this theory to prove Bhalla and Roy's suggestion. His research included a much bigger population, he used data for the entire country of India (88,046 households) during the green revolution period (1975-1976). The author pointed out that he has used the approach of Cline (1970) and Bharadwaj (1974) – land was divided on net sown area and gross cropped area. The reason for that is obvious – areas at some period of time may be unused, so no outcome is produced.

Helfand (2003) has shown that the relationship between farm size and productivity is more complex than it was earlier believed. Applying Data Envelopment Analysis (DEA), a U-shaped relationship was determined: the productivity first falls (for farms up to 200 hectares) and then rises. He avoided the aggregation bias by using the data from 426 counties, four types of land tenure and 15 classes of farm size. Also recent research has shown that the larger the land holding – the larger is farm productivity. Additional analysis has been done by the World Bank to identify relationship between farm size and productivity (Hanstad 1998). A World Bank study of Polish private farms found that small farms were more efficient than large farms over 20 hectares. Relative total factor productivity (TFP) was highest for farms of 10-15 hectares, but farms of 5-10 hectares and farms less than 5 hectares also showed higher total factor productivity than farms over 20 hectares (Zyl et al., 1996). Further research indicates that family farms are more efficient and superior to other structures of farming such as collective farms or large enterprise farming because of the way in which labor relations are organized (Berry and Cline. 1979).

Additional factor that drew researchers' attention was educational level. Kausar (2011) indicated that knowledge of farming can be obtained directly by education, and many studies

have shown that the level of education has a positive influence on farm productivity and farm income. The research revealed that education is positively related to the types of product that increase farm income. Moreover, education may have a spillover effect: the education level of coworker/neighbor may influence farm household head productivity. Gille (2011) studied the existence of education spillovers in rural India; by testing whether the education level of the neighborhood has a positive impact on households' farm productivity. The results showed that one additional year in the mean numbers of years of education increases farm household productivity by three percent. Nelson and Phelps (1966) indicated that better educated farmers are quicker to adopt profitable new processes and products since, for him, the expected payoff from innovation is likely to be greater and the risk likely to be smaller.

CHAPTER 3.
METHODOLOGY

Population and Sample

The target population for this study was defined as private farmers in Ukraine. The accessible population included private farmers in three selected oblasts in the central region of Ukraine. The location of selected oblasts is indicated on Ukrainian map (Appendix A). The sample consisted of registered private farmers in the three oblasts selected for inclusion in the study. A total of 250 farmers were randomly selected in two of the oblasts and 150 in the other (due to the size of the population in the smaller sample) for personal interviews by the raion specialists. Lists of the populations of registered private farmers in the three oblasts were obtained from the respective oblast authorities. There were 1,128; 1,038; and 652 registered private farmers in the three oblasts included in the study. Random samples were drawn from these lists using a computerized random numbers table. Primary and alternate lists of sample respondents were prepared. If a farmer on the primary list refused to be interviewed or could not be found after two attempts by the raion specialist the next name on the alternate list was chosen.

Instrumentation

The farmers' survey was designed in Ukrainian (Appendix B) and English (Appendix C) languages to collect information about Ukrainian farmers' personal attributes, their agricultural operations, including production, management, and marketing of cereal and horticultural crops and livestock products, farm assets, knowledge and adoption of agricultural best management practices. The survey instrument was designed at a research extensive university in the United States by research faculty members who served as consultants on the project. The instrument was then tested with a small sample (n = 50) of agricultural producers in the Ukraine that were not selected as members of the research sample. Content validity of the instrument was

established through a review by a panel of experts consisting of raion specialists and private farmers in other oblasts in Ukraine. Research methods and the survey were approved by the Institutional Review Board, Louisiana State University (Appendix D).

Data Collection

Data collection was initially conducted during August and September of 2004. All data collection was completed by the end of September 2004. Raion specialists took part in a one-day training session to learn personal interview techniques, become familiar with the survey instruments, and practice interviewing. In the practice session, each raion specialist interviewed a fellow raion specialist to get the experience of a real-life encounter.

Information gathered in the surveys was entered into an Access database and analyzed for entry errors. After a thorough data cleaning process was completed, data were exported from Access and imported into SPSS statistical software for data analysis.

Data Analysis

Data gathered in this study were analyzed according to the stated objectives.

Objective 1. Describe private farmers in selected oblasts in Ukraine on the following personal attributes and agricultural operations: age, gender, educational level, household composition, occupation and income, organizational affiliations, length of time in private farming, acquisition and area of private farming land and other farm assets. Descriptive statistics were used to summarize the information regarding these demographic characteristics. Variables that were measured on an interval scale of measurement were summarized using means and standard deviations. Variables that were measured on a categorical scale of measurement (nominal or ordinal) were summarized using frequencies and percentages in categories.

Objectives 2. Describe agricultural production and marketing characteristics of Private Farmers in Selected Oblasts in Ukraine. Information regarding the production and marketing variables were summarized using means and standard deviations (for variables that were measured on an interval or ratio scale) and frequencies and percentages in categories)for variables measured on a categorical scale of measurement – nominal or ordinal).

Objective 3. Use Multiple Regression analysis to determine major factors that impacting agricultural production of Ukrainian Farmers in selected three Oblasts.

This objective was accomplished using multiple regression analysis with the overall production score used as the dependent variable and the selected personal and farm characteristics used as the independent variables. Independent variables were added to the explanatory model on a stepwise basis due to the exploratory nature of the research. Also, independent variables that added approximately one percent to the explained variance were included in the model (even if the individual variable was not significant) as long as the overall model remained statistically significant.

CHAPTER 4.
RESULTS AND FUNDINGS

The results of the study are presented according to the objectives that were established.

Objective One Results

Objective 1: Describe private farmers in selected oblasts in Ukraine on the following personal attributes and agricultural operations: age, gender, educational level, household composition, occupation and income, organizational affiliations, length of time in private farming, acquisition and area of private farming land and other farm assets.

Age

The mean age of private farmers in the three selected oblasts in Ukraine was 45.8 years (SD = 10.05). To further examine the data regarding age, the researcher grouped the data into age categories. When the data were examined in these categories, more than two-thirds (67.3%) were 50 years of age or younger (see Table 1).

Table 1.
Age of private farmers in Three Selected oblasts in Ukraine

Age (years)	Number of farmers	% of farmers
30 or under	51	7.8
31-40	142	21.7
41-50	248	37.8
51-60	169	25.8
Over 60	45	6.8
Total	655	100.0

Note. Mean age = 45.8 years, Standard Deviation = 10.05.
Note. Three of the study participants did not respond to the question regarding age.

Gender

When study participants were examined on the variable gender, more than 90% (n = 594) of the farmers in the sample were found to be male, and 9.7% (n = 64) were female (Table 2).

Table 2.
Gender of private farmers in Three Selected oblasts in Ukraine

Gender	Number of farmers	% of farmers
Male	594	90.3
Female	64	9.7
Total	658	100.0

Highest Level of Education

Another variable on which farmers in the sample were described was their highest level of education completed. The majority (52%, n = 341) of the farmers in the sample reported that they had completed a university degree, and 30.7% (n = 201) reported that they had finished a technical college program (see Table 3). Only 6.7% (n = 44) reported having completed a high school diploma or less among the participating farmers.

Table 3.
Highest level of education completed by private farmers in Three Selected oblasts in Ukraine

Highest level of education	Number of farmers	% of farmers
8 years school	2	0.3
High School	44	6.7
Vocational school	60	9.2
Technical college	201	30.7
University degree	341	52.0
Master's degree	5	0.8
Candidate of Science	2	0.3

(Table 3 continued)

Highest level of education	Number of farmers	% of farmers
Total	655	100.0

Note. Three of the study participants did not respond to the question regarding age.

Composition of Household

Respondents were also asked to provide information about the relatives that were currently living in their households. Parents/grandparents, spouses, and children were the main relatives living in the farmers' households (see Table 4). One or more children and a spouse were reported as members of the household by the majority of respondents in the study (n = 615 or 93.5% and n = 594 or 90.3% respectively). Additionally, one or more "Other" relatives were reported as living in the household by more than 10% (n = 78 or 11.9%) of the study participants (see Table 4).

In addition to the presence of the relatives in the home, participants were asked to report the mean ages of each of the groups of these relatives. Among the children living in the respondents' households, the mean age was 19.6 years (SD = 15.2); while the mean age of the spouses reported was 42.7 years (SD = 21.9) (see Table 4).

One additional question was asked regarding the relatives living in the household. Respondents were also asked to indicate for each of these relatives/group of relatives whether or not they helped with the farming operation. Examination of the responses provided to this request revealed that the majority of all of the groups of household members did help with the farming operation. The household member that was reported as helping with the farming operation by the largest number of respondents was "Spouse" (n = 554, 93.3%) (see Table 4).

Table 4.
Relatives Living in the Households of private farmers in Three Selected Oblasts in Ukraine

Relative living in household	Number and percent of households		Mean age of relative	Number of relatives helping with farming operation	
	n	%	Years	n	%
Child	615	93.5	19.6	437	71.1
Spouse	594	90.3	42.7	554	93.3
Parent	114	17.3	60.4	99	86.8
Other	78	11.9	33.9	63	80.8

Occupation and Income

Participants in the study were also asked to respond to a series of questions regarding the source of their family income. They were first asked to indicate whether their farming occupation was full-time or part-time. The majority of respondents reported that they farmed on a full-time basis (n = 558, 87.2%). Eighteen of the study participants did not respond to the questions in this series of items (see Table 5).

Additionally, participants were asked to indicate whether or not farming was their major family income source. Similarly to the responses on the item regarding full-time status, 87.2% (n = 558) of the respondents reported that farming was the major source of their family income (see Table 5).

Another aspect of family income that was examined was income sources other than the farming operation. The majority of respondents in the study indicated that they had one or more sources of income other than their farming operation. The source that was reported by the largest number of participants was “Sale of home plot produce” (n = 4.00, 62.5%). In addition,

224 (35.0%) of the participants reported that "Salary from spouse's job" was another source of family income (see Table 5).

Table 5.
Occupation and Income of Private Farmers in Three Selected Oblasts in Ukraine

Variable	Number of farmers	% of farmers
Farming as occupation		
Full-time	558	87.2
Part-time	82	12.8
Total	640	100.0
Farming as major family income source		
Yes	558	87.2
No	82	12.8
Total	640	100.0
Other family income sources		
Sale of home plot produce	400	62.5
Salary from spouse's job	224	35.0
Salary from farmer's job	131	20.5
Government pension	112	17.5
Non-agricultural business	60	9.4
Other[a]	22	3.4

Note. 18 of the study participants did not respond to the question regarding occupation and income.
[a]Other family income sources – Type and number of respondents: Child care assistance (n = 1); Construction site work (n = 1); Daughter's salary (n = 1); Gas station owner (n = 2); Lease agricultural machinery (n = 1); Mother's/parents' government pension (n = 4); Private store (n = 2); Customized services, i.e., grain harvesting (n = 1), machinery (n = 1); tillage (n = 3); weddings (n = 1); Sell spares of farm machinery (n = 2); Sell honey (n = 1); Unemployment subsidy (n = 1).

Organizational Affiliation, Benefits and Interests

When participating farmers were asked to indicate their affiliation with selected groups and organizations, the majority of respondents (n = 501, 77.2%) reported that they belonged to a

"Farmer's Association." Less than 10% of respondents indicated membership in the other organizations that were included in the question (see Table 6).

In addition to being asked about their membership in the selected groups and organizations, participating farmers were provided a series of potential benefits from membership/affiliation with participating in these organizations, and regardless of their membership status they were asked, for each of the potential benefits, to tell whether or not they considered it to be a benefit. The benefit that was reported by the largest number of respondents was "Information sharing" (n = 517, 79.7%). All of the potential benefits that were included in the instrument were selected by a majority of the participants except "Support for political issues" (n = 137, 21.1%) (see Table 6).

When asked to indicate if they had an interest in joining organizations to participate in each of eight selected activities, the activities that were selected by the largest groups of study participants were to "Improve input conditions" (n = 616, 94.9%) and "Improve market conditions" (n = 605, 93.2%). Overall, seven of the eight activities included in the instrument were identified as an interest by a majority of the respondents (see Table 6). As with the item on the perceived benefits, the one item that was not identified by a majority of participants was "Support political issues" (n = 207, 31.9%).

Table 6.
Organizational affiliation and perceived benefits and interests in belonging to groups and organizations among private farmers in Three Selected Oblasts in Ukraine

Variable	Number of farmers	% of farmers
Groups and organizations belonged to[a]		
Farmers association	501	77.2
Civic/social group	59	9.2
Agricultural cooperative	14	2.2

(Table 6 continued)

Variable	Number of farmers	% of farmers
Women's association	9	1.4
Other[a]	11	1.7
Benefits perceived by belonging to selected groups and organizations		
Information sharing	517	79.7
Selling agricultural produce	411	63.3
Buying agricultural inputs	404	62.2
Farm operations assistance	369	56.9
Support for political issues	137	21.1
Interest in joining organizations to participate in selected activities[b]		
Improve input conditions	616	94.9
Improve market conditions	605	93.2
Improve credit conditions	555	85.5
Influence agricultural research	524	80.7
Influence agricultural education	524	80.7
Plan farm projects	450	69.3
Plan community projects	393	60.6
Support political issues	207	31.9

Note. 9 of the study participants did not respond to the question regarding organizational affiliation.

[a]Other groups belonged to and number of mentions: Advisory Committee (4); Association of Vegetable Producers (2); Association of Taxpayers (1); Orchard Growers of Ukraine (1); Raion Council (3).

[b]Other interests indicated and number of mentions: Engage in orchard production (1); How to set up an agricultural cooperative (1); Influence price parity for agricultural commodities (1); Influence price policy in the country (1).

Length of Time in Private Farming

Participating farmers in the study were asked about the number of years they had been in farming as a private farmer. The number of years ranged from 0 to 16 with a mean number of years of 6.14 (SD = 3.58) (see Table 7).

Participating farmers were also asked to indicate the length of time that their farms had been officially registered. The mean length of time that the farms had been officially registered was 5.83 years (SD = 3.60). The responses to this item ranged from a low of 0 years to a maximum of 13 years (see Table 7).

Table 7.
Years as a private farmer and years as an officially registered farm among private farmers in Three Selected Oblasts in Ukraine

Year Category	Years as a private farmer[a]		Years since officially registered farm[b]	
	Number	%	Number	%
10 or more	201	31.2	190	29.5
4 – 9	264	41.0	239	37.1
3 or less	179	27.8	215	33.4
Total	644	100.0	644	100.0

Note. 14 of the study participants did not respond to the questions regarding years in farming.
[a]Mean years as a private farmers = 6.14, SD = 3.58, Range 0 – 16.
[b]Mean years since officially registered farm = 5.83, SD = 3.60, Range 0 – 13.

Acquisition and Area of Private Farming Land

Another variable investigated in the study was how farmers acquired the land that they were currently farming. Respondents were asked to identify for each of the methods listed whether or not that was a mode of acquisition through which they received all or some of their farm land. The mode identified by the largest number of farmers was by "Village council title" (n = 545, 83.5%) (see Table 8). Each of the other listed modes were selected by less than half of the responding farmers.

Participating farmers were also asked to report the number of hectares acquired by each of the modes that they identified as one of their methods. While "Village council title" was identified by the largest number of farmers, the mode through which the farmers acquired the largest number of hectares (both overall and per farmer that identified that mode) was "Leased" (total number of hectares = 34,469 and number of hectares per farmer selecting that mode = 123.1) (see Table 8). Other methods included leasing (42.9% of farmers) and family land-shares (31.2% of farmers). The total area of land held by private farmers from the sources identified in the responses was 58,516 hectares for an average farm size per farmer of 89.6 hectares. The area (see Table 8) held under lease was more than one-half of the total land area.

Table 8.
Mode of acquisition and area of farmland held by private farmers in Three Selected Oblasts in Ukraine

How land acquired	Number and percent of farmers		Area (hectares)	
	Number	%	Total	Average [a]
Village council title	545	83.5	19,384	35.5
Leased	280	42.9	34,469	123.1
Family landshares	204	31.2	4,333	21.2
Other [b]	3	0.5	330	110
Total	---	---	58,516	89.6[c]

Note. 5 of the study participants did not respond to the questions regarding land acquisition and area acquired.
[a]Average number of hectares for each land acquisition method.
[b]Other acquisition methods mentioned and number of hectares: Fallow land (168 hectares); Land reserve (77 hectares); Land shares of other people besides family (85 hectares).
[c]Average number of hectares per farmer for all land acquisition methods.

Breakdown of Farmland

Participating farmers were also asked to indicate the number of pieces of land into which farms were distributed. The majority of farms (n = 408, 62.5%) were single, undivided pieces

(see Table 9). One hundred forty-eight farms (22.6%) were made up of two pieces of land. The remaining farms (14.9%) were divided into 3, 4, 5, or 6-12 pieces.

Table 9.
Number of pieces of land into which farms of private farmers in Three Selected Oblasts in Ukraine are broken

Number of pieces of land	Number and percent of farmers	
	Number	%
One	408	62.5
Two	148	22.6
Three	44	6.7
Four	16	2.5
Five	16	2.5
Six-twelve	21	3.2
Total	653	100.0

Note. 5 of the study participants did not respond to the question regarding breakdown of land.

Other Farm Assets

Besides land, farmers were asked to identify other farm assets that they owned such as farm buildings and structures and farm equipment and machinery.

Various buildings and structures reported as owned by participating farmers in the study are shown in Table 10. The structure that was reported by the largest number of farmers was Garage (n = 315, 47.9%). Additionally, Covered Grain Storage (n = 260, 39.5%) and Cattle Barn/Shed (n = 248, 37.7%) were each reported by more than one-third of the respondents (see Table 10).

In addition to reporting the structures that they owned, respondents were also asked to identify the approximate age of each of the structures that they reported. The structure that was reported as having the oldest average age among those owned by farmers was the "Underground

vegetable/fruit storage" with a mean age of 18.2 years (range = 1-60 years) (see Table 10). Generally, the buildings and structures were found to be in the range of 12 to 18 years old. However, each of the structures reported had some examples of relatively new construction (two years or less old) and some examples of very old construction (25 to as much as 74 years old) (see Table 10).

In addition to age, the respondents were also asked to indicate the size of the buildings/structures that they owned. The largest average size structure that was reported by the study participants was the "Machinery shed" which ranged in reported size from 1 square meter to 60,000 square meters (mean = 1,085.4 square meters). The smallest average size facility was the "Underground vegetable/fruit storage" which had a mean size of 53.9 square meters (range of 6 to 1,000 square meters. Considering all buildings/structures, the average area for the sample of farmers was 323.3 sq. meters (see Table 10).

Farmers were also asked to report if they had added any new structures in the current year, and if so the size in square meters of the new structures. A total of 72 farmers (10.9%) reported that they had added a new structure, and the average size of these new structures was 126.4 square meters (total area = 9,101 sq. meters).

Table 10.
Buildings and structures on farms of private farmers in Three Selected Oblasts in Ukraine

Building/structure	Number and percent of farmers		Average age/(range) (years)	Average area/(range) (sq. meters)
	N	%		
Garage	315	47.9	13.5/ (1 – 50)	90.2/ (6 – 2,810)
Covered grain storage	260	39.5	16.1/ (1 – 74)	432.9/ (10 – 15,000)
Cattle barn/shed	248	37.7	17.4/ (1 – 50)	245.8/ (11 – 19,200)

(Table 10 continued)

Building/structure	Number and percent of farmers		Average age/(range) (years)	Average area/(range) (sq. meters)
Machinery shed	206	31.3	14.1/ (2 - 70)	1,085.4/ (1 – 60,000)
Underground vegetable/fruit storage	176	26.7	18.2/ (1 – 60)	53.9/ (6 – 1,000)
Hangar	106	16.1	13.2/ 1 – 40)	328.0/ (20 – 2,000)
Workshop (metal, carpentry)	100	15.2	14.9/ (1 – 45)	82.8/ (5 – 1,480)
Bunker	10	1.5	12.8/ (2 – 25)	131.6/ (15 – 600)
Other[a]	6			
All buildings/structures	---	---	---	323.3

[a]Other buildings/structures and area mentioned: Grain drying/cleaning facility (n = 1, 9 sq. meters); Shed (n = 1, 30 sq. meters); Apiary (n = 1, 41 sq. meters); Canteen (n = 1, 40 sq. meters); Mill (n = 1, 480 sq. meters); Sausage-making facility (n = 1, 360 sq. meters); Tobacco drying facility (n = 1, 1,260 sq. meters).

Another variable on which participating farmers were described was the machinery and equipment used on their farms. Regarding this measurement, farmers were asked to indicate not only if they used each of the identified types of machinery/equipment on their farms, but also whether the equipment was owned, leased/borrowed, and/or loaned/shared. Since the farmer was asked to indicate all that apply for each of these methods of acquiring the noted types of machinery/equipment, the total number identified as reporting "Used in Farm Operation" is not the sum of the three methods of acquisition. This information is presented in Table 11. The equipment that was reported as used on the farm by the largest group of respondents was a

tractor (n = 639, 97.1%) of the 639 respondents who reported using a tractor on their farm, 82.3% (n = 526) indicated that one or more of the tractors that were used was owned. Additionally, 22.4% (n = 143) reported that they leased/borrowed one or more tractors, and 10.5% (n = 67) indicated that they loaned/shared one or more tractors. Overall, eight of the 14 types of machinery/equipment examined in the study were reported as used by more than half of the study participants (see Table 11).

Table 11.
Machinery and equipment used on farm by private farmers in Three Selected Oblasts in Ukraine

Item	Number and percent of farmers by type of use (N=658)							
	Used in farm operation		Owned		Leased/borrowed		Loaned/shared	
	N	%	N	% [a]	N	% [a]	N	% [a]
Truck	518	78.7	316	61.0	200	38.6	65	12.5
Car	452	68.7	429	94.9	17	3.8	41	9.0
Horse cart	104	15.8	83	79.8	20	19.2	8	7.7
Tractor	639	97.1	526	82.3	143	22.4	67	10.5
Trailer	537	81.6	440	81.9	99	18.4	54	10.1
Cultivator	619	94.1	376	76.9	138	22.3	70	11.3
Planter	70	10.6	56	80.0	20	28.6	6	8.6
Combine	581	88.3	261	44.9	305	52.5	83	14.3
Sprayer	439	66.7	224	51.0	183	41.9	68	15.5
Seeder	602	91.5	411	68.3	175	29.1	86	14.3
Milking machine	20	3.0	18	90.0	---	---	---	---
Feed mill	82	12.5	78	95.1	3	3.7	2	2.4

(Table 11 continued)

Item	Number and percent of farmers by type of use (N=658)							
	Used in farm operation		Owned		Leased/borrowed		Loaned/shared	
	N	%	N	% [a]	N	% [a]	N	% [a]
Power tiller (hand)	18	2.7	15	83.3	0	0.0	1	5.6
Power mower	165	25.1	127	77.0	5	21.2	25	15.2
Other[b]	43	6.5	43	100	---	---	---	---

[a]% of those farmers who used different items: for example, 518 farmers used trucks; 316 of these 518 farmers (61.0%) owned their own truck; 200 of these 518 farmers (38.6%) leased/borrowed a truck; 65 of these 518 farmers (12.5%) loaned/shared a truck.
[b]Other equipment owned and number of units: Plough (25); Disk harrow (9); Fertilizer/manure spreader (2); Drip irrigation equipment (1); Grain cleaner (1); Sunflower processing equipment (1); Root drying (1); Bus (1); Roller (1); Mattock (1).

For the machinery/equipment reported as used on the farm, respondents were also asked to indicate the number of units of each type of machinery/equipment identified. The equipment that was identified as having the greatest number of unites used in the farming operation was the tractor (n = 1,293). The equipment type that was reported as having the smallest number of units used in the farming operation was the Power Hand Tiller (n= 15) (see Table 12).

Study participants were also asked to report if they had purchased machinery/equipment within the last two years. Nearly a third of the farmers (n = 200 or 30.4%) purchased additional machinery and equipment within the past year.

Table 12.
Number of units of machinery and equipment owned, leased/borrowed, loaned/shared by private farmers in Three Selected Oblasts in Ukraine

Item	Units owned	Units leased/borrowed	Units loaned/shared	Total units
Truck	473	257	75	805
Car	466	18	43	527

(Table 12 continued)

Item	Units owned	Units leased/borrowed	Units loaned/shared	Total units
Horse cart	119	49	8	176
Tractor	981	220	92	1293
Trailer	749	143	69	961
Cultivator	776	173	82	1031
Planter	61	22	6	89
Combine	353	350	85	788
Sprayer	233	184	68	485
Seeder	618	210	100	928
Milking machine	522	---	---	522
Feed mill	87	4	2	93
Power tiller (hand)	15	---	---	15
Power mower	50	40	26	216

Objective Two Results

The second objective of this study was to describe agricultural production and marketing characteristics of Private Farmers in Selected Oblasts in Ukraine.

Crop Production

Tables 13 and 14 show the different row (cereals/grains) crops and horticultural crops cultivated by farmers in the most recent crop season. Information for each crop includes number and percent of farmers growing the crop, area harvested (total and average per farmer), amounts

of the crop produced (total production and average yield per hectare), and the amounts of the crop sold, used in the home, and kept for seed (totals and averages per farmer). Table 15 gives the number of hectares of other row and horticultural crops raised during year of 2004.

Wheat was the row crop reported to have been grown by the largest number of farmers in the study (n = 459, 69.8%). The mean number of hectares grown by the 459 farmers who reported growing wheat was 33.1. The average number of centners grown per hectare was 34.0. Farmers who grew wheat reported that they sold most of the crop that they harvested (463,020.0 centners of 517,174.0 centners harvested) (see Table 13). They did, however, also indicate that they used some of the crop in home, and that they kept some of the crop for seed.

The second most frequently grown crop was barley (n = 458, 69.6%). Statistics for the barley crop were similar to those for the wheat crop. The majority of the crop was sold, but some of the harvest was kept for use in home and for seed (see Table 13).

Other row crops grown by a substantial number of the farmers were buckwheat (36.0% of farmers), corn (30.0% of farmers), sugar beet (24.9% of farmers), and sunflower (21.4% of farmers).

Table 13.
Row crop production and disposal by private farmers in Three Selected Oblasts in Ukraine

Crop	Unit of measure	Quantity
	Wheat	
Number of wheat producers	Number	459
% of all producers	%	69.8
Area harvested (hectares)	Total	15,202.7
	Average	33.7
Amount produced (centners)	Total	517,174.0
	Yield/ha	34.0

(Table 13 continued)

Crop	Unit of measure	Quantity
Amount sold (centners)	Total (n = 401)	463,020.0
	Average	1,154.7
Amount used in home	Total (n = 308)	46,870.1
(centners)	Average	152.2
Amount kept for seed	Total (n = 367)	55,616.1
(centners)	Average	151.5
	Rye	
Number of rye producers	Number	60
% of all producers	%	9.1
Area harvested (hectares)	Total	1,560.0
	Average	26.4
Amount produced (centners)	Total	42,802.5
	Yield/ha	27.4
Amount sold (centners)	Total (n = 48)	30,141.0
	Average	627.9
Amount used in home	Total (n = 20)	5,933.5
(centners)	Average	296.7
Amount kept for seed	Total (n = 38)	2,752.0
(centners)	Average	72.4
	Barley	
Number of barley producers	Number	458
% of all producers	%	69.6
Area harvested (hectares)	Total	13,923.0

(Table 13 continued)

Crop	Unit of measure	Quantity
	Average	30.7
Amount produced (centners)	Total	414,789.5
	Yield/ha	29.8
Amount sold (centners)	Total (n = 398)	284,758.1
	Average	715.5
Amount used in home	Total (n = 312)	48,942.3
(centners)	Average	156.9
Amount kept for seed	Total (n = 356)	39,633.6
(centners)	Average	111.3
	Buckwheat	
Number of buckwheat	Number	237
producers		
% of all producers	%	36.0
Area harvested (hectares)	Total	3,533.0
	Average	14.8
Amount produced (centners)	Total	37,821.6
	Yield/ha	10.7
Amount sold (centners)	Total (n = 199)	27,945.6
	Average	140.4
Amount used in home	Total[a] (n = 112)	2,560.9
(centners)	Average[b]	22.9

(Table 13 continued)

Crop	Unit of measure	Quantity
Amount kept for seed	Total (n = 155)	3,445.8
(centners)	Average	22.3
	Corn	
Number of corn producers	Number	200
% of all producers	%	30.4
Area harvested (hectares)	Total	7,112.8
	Average	38.2
Amount produced (centners)	Total	352,726.0
	Yield/ha	49.6
Amount sold (centners)	Total (n = 161)	310,717.0
	Average	1,929.9
Amount used in home	Total (n = 103)	25,306.0
(centners)	Average	245.7
Amount kept for seed	Total (n = 17)	1,654.0
(centners)	Average	97.3
	Sugarbeet	
Number of sugarbeet producers	Number	164
% of all producers	%	24.9
Area harvested (hectares)	Total	2,457.7
	Average	15.1

(Table 13 continued)

Crop	Unit of measure	Quantity
Amount produced (centners)	Total	632,562.0
	Yield/ha	257.4
Amount sold (centners)	Total (n = 141)	594,843.0
	Average	4,218.7
Amount used in home	Total (n = 4)	1,852.0
(centners)	Average	463.0
Amount kept for seed	Total (n = 1)	0.2
	Average	0.2
	Sunflower	
Number of sunflower	Number	141
producers		
% of all producers	%	21.4
Area harvested (hectares)	Total	4,631.3
	Average	34.3
Amount produced (centners)	Total	79,315.0
	Yield/ha	17.1
Amount sold (centners)	Total (n = 115)	61,787.3
	Average	537.3
Amount used in home	Total (n = 52)	2,367.2
(centners)	Average	45.5

(Table 13 continued)

Crop	Unit of measure	Quantity
Amount kept for seed	Total (n = 19)	488.5
(centners)	Average	25.7
	Green forage, silage, hay	
Number of forage/silage/hay	Number	61
producers		
% of all farmers	%	9.3
Area harvested (hectares)	Total	1,653.7
	Average	28.0
Amount produced (centners)	Total	159,375.0
	Yield/ha	96.3
Amount sold (centners)	Total (n = 16)	17,205.0
	Average	1,075.3
Amount used in home	Total (n = 24)	132,597.0
(centners)	Average	5,524.9

Total = Total amount for those producers who harvested, produced, sold, or used crop in the home in the previous production year.
Average = Average amount per producer who harvested, produced, sold, or used crop in the home in the previous production year.

The horticultural crop that was reported as grown by the largest number of the participating farmers was Potatoes (n = 50, 7.6%). As with the row crops previously reported, the majority of the potato crop was sold. However, similarly to most of the row crops reported in the study, a portion of the potatoes grown was kept for home use and for seed for the next crop.

All of the other horticultural crops reported as grown by producers in the study were identified as a crop produced by less than 5% of the study participants (see Table 14).

Table 14
Horticultural crop production and disposal by private farmers in Three Selected Oblasts in Ukraine

Crop	Unit of measure	Quantity [a]
	Potatoes	
Number of potato producers	Number	50
% of all farmers	%	7.6
Area harvested (hectares)	Total[b]	79.5
	Average[c]	1.9
Amount produced (centners)	Total	16,125.0
	Yield/ha	202.8
Amount sold (centenrs)	Total (n = 40)	9,541.0
	Average	251.1
Amount used in home	Total (n = 40)	2,257.0
(centners)	Average	56.4
Amount kept for seed	Total (n = 43)	2,248.0
(centners)	Average	52.3
	Carrots	
Number of carrot producers	Number	15
% of all farmers	%	2.3
Area harvested (hectares)	Total[b]	21.3
	Average[c]	1.4

(Table 14 continued)

Crop	Unit of measure	Quantity [a]
Amount produced (centners)	Total	3,651.0
	Yield/ha	171.4
Amount sold (centners)	Total (n = 13)	3,292.0
	Average	253.2
Amount used in home	Total (n = 9)	146.0
(centners)	Average	16.2
Amount kept for seed	Total (n = 2)	210.0
(centners)	Average	105.0
	Cabbage	
Number of cabbage	Number	24
producers		
% of all farmers	%	3.6
Area harvested (hectares)	Total[b]	59.5
	Average[c]	2.5
Amount produced (centners)	Total	11,860.0
	Yield/ha	199.3
Amount sold (centners)	Total (n = 20)	10,410.0
	Average	520.5
Amount used in home	Total (n = 14)	194.3
(centners)	Average	13.9

(Table 14 continued)

Crop	Unit of measure	Quantity [a]
Amount kept for seed	Total (n = 1)	300.0
(centners)	Average	300.0
	Cucumbers	
Number of cucumber	Number	13
producers		
% of all farmers	%	2.0
Area harvested (hectares)	Total[b]	21.6
	Average[c]	1.8
Amount produced (centners)	Total	1,659.0
	Yield/ha	76.8
Amount sold (centners)	Total (n = 12)	1,351.0
	Average	112.6
Amount used in home	Total (n = 6)	30.0
(centners)	Average	5.0
	Tomatoes	
Number of tomato producers	Number	23
% of all farmers	%	3.5
Area harvested (hectares)	Total[b]	179.4
	Average[c]	8.2
Amount produced (centners)	Total	20,524.0
	Yield/ha	114.4

(Table 14 continued)

Crop	Unit of measure	Quantity [a]
Amount sold (centners)	Total (n = 12)	1,351.0
	Average	112.6
Amount used in home	Total (n = 11)	149.5
(centners)	Average	13.6
	Onions	
Number of onion producers	Number	13
% of all farmers	%	2.0
Area harvested (hectares)	Total[b]	24.0
	Average	1.9
Amount produced (centners)	Total	1,967.0
	Yield/ha	82.0
Amount sold (centners)	Total (n = 13)	1,762.0
	Average	135.6
Amount used in home	Total (n = 4)	127.0
(centners)	Average	31.8
Amount kept for seed	Total (n = 2)	31.0
(centners)	Average	15.5
	Apples	
Number of apple producers	Number	14
% of all farmers	%	2.1

(Table 14 continued)

Crop	Unit of measure	Quantity [a]
Area harvested (hectares)	Total[b]	85.1
	Average[c]	6.6
Amount produced (centners)	Total	1,944.0
	Yield/ha	22.8
Amount sold (centners)	Total (n = 6)	1,751.4
	Average	291.9
Amount used in home	Total (n = 4)	12.6
(centners)	Average	3.2

[a] Plums: 4 farmers produced 5.1 centners on 2 hectares; Young fruit trees for planting: 3 farmers sold 5,000 trees.
[b]Total = Total amount for those producers who harvested, produced, sold, or used crop in the home.
[c]Average = Average amount per producer who harvested, produced, sold, or used crop in home.

Study participants were also asked to indicate any other crops that they produced, and if there were any to report the number of hectares of each they grew. Each of 22 additional crops were reported as grown by one of the farmers who participated in the study. The crop which had the greatest number of hectares cultivated was soybeans (664.2 hectares). These 22 other crops were raised on a total of 2,281 hectares (see Table 15). Other significant crops raised were peas (395.2 ha), summer/spring wheat (361 ha), millet (202.0 ha), flax (172.0 ha) and chicory (164 ha).

Table 15.
Number of hectares of other crops raised by private farmers in Three Selected Oblasts in Ukraine

Other crop	Number of hectares
Soybean	664.2

(Table 15 continued)

Other crop	Number of hectares
Peas	395.2
Summer/spring wheat	361.0
Millet	202.0
Flax/flax for grain	172.0
Chicory	164.0
Winter grape/grape	79.5
Triticale	55.0
Medicinal crops (herbs)	42.0
Kidney beans	32.0
Oats	19.5
Watermelon	19.0
Mustard	16.9
Tobacco	15.0
Young orchard	10.0
Cover crops	8.0
Vegetable seeds	7.7
Currants/black currants	6.0
Table beets	5.0
Vetch	5.0
Berries	2.0
Grapes	0.7
Total	2,281.7

Livestock Production

Famers in the three selected Oblasts who participated in the study were also asked to report information regarding their livestock production. The livestock that was reported to be produced by the largest percentage of farmers was swine (n = 217, 33.0%). The total number of head produced was 3,598, which is an average of 16.6 head per producer (see Table 16).

The livestock that was reported by the second largest number of farmers was dairy (n = 156, 23.7%). The total number of milking cows reported in the three oblasts was 1,642 which means that the dairy producers had a mean of 10.5 cows each. These farmers produced 4,740.5 tons of milk most of which was sold (3,614.3 tons). However, a large group (n = 128) of the farmers kept at least a small portion of the milk for home use (331.1 tons) (see Table 16).

The information presented in Table 16 shows the number and percent of producers raising animals of different species, total and average number of animals of each species owned by these producers, total amounts of animal products produced and the quantities per animal, and the amounts of animal products sold and used in the home (totals and averages per farmer).

Table 16.
Livestock production and disposal by private farmers in Three Selected Oblasts in Ukraine

Livestock or livestock product	Unit of measure	Quantity [a]
	Dairy	
Number of dairy producers	Number	156
% of all farmers	%	23.7
Number of milking cows	Total[b]	1,642.0
	Average[c]	10.5
Milk produced (tons)	Total	4,740.5
	Per cow	2.9
Milk sold (tons)	Total (n = 135)	3,614.3
	Average	26.8

(Table 16 continued)

Livestock or livestock product	Unit of measure	Quantity [a]
Milk used in home (tons)	Total (n = 128)	331.1
	Average	2.6
	Beef	
Number of beef producers	Number	86
% of all farmers	%	13.1
Number of beef cattle	Total[b]	1,436.0
	Average[c]	16.7
Beef produced (centners)	Total	3,288.4
	Per head	2.3
Beef sold (centners)	Total (n = 68)	2,757.1
	Average	40.6
Beef used in home (centners)	Total (n = 17)	219.6
	Average	12.9
	Breeding sows	
Number of breeders	Number	39
% of all farmers	%	5.9
Number of breeding sows	Total[b]	337.0
	Average[c]	8.6
Number produced	Total	1678.0
	Average	69.9

(Table 16 continued)

Livestock or livestock product	Unit of measure	Quantity [a]
Number sold	Total (n = 20)	1,075.0
	Average	53.8
Number used in home	Total (n = 17)	459.4
	Average	27.0
	Swine	
Number of swine producers	Number	217
% of all farmers	%	33.0
Number of swine	Total[b]	3,598.0
	Average[c]	16.6
Pork produced (centners)	Total	4,224.1
	Per head	1.2
Pork sold (centners)	Total (n = 162)	3,552.7
	Average	21.9
Pork used in home (centners)	Total (n = 183)	899.3
	Average	4.9
	Chicken (Broilers)	
Number of broiler producers	Number	126
% of all farmers	%	19.1
Number of broilers	Total[b]	4,251.0
	Average[c]	33.7

(Table 16 continued)

Livestock or livestock product	Unit of measure	Quantity [a]
Broilers produced (kgs)	Total	8,891.0
	Per bird	2.1
Broilers sold (kgs)	Total (n = 21)	1,235.0
	Average	58.1
Broilers used in home (kgs)	Total (n = 106)	7,479.0
	Average	70.6
	Ducks	
Number of duck producers	Number	69
% of all farmers	%	10.5
Number of ducks	Total[b]	1,970.0
	Average[c]	28.6
Ducks produced (kgs)	Total	4057.0
	Per bird	2.1
Ducks sold (kgs)	Total (n = 20)	1,682
	Average	84.1
Ducks used in home (kgs)	Total (n = 53)	2,729.5
	Average	51.5
	Geese	
Number of geese producers	Number	72
% of all farmers	%	10.9

(Table 16 continued)

Livestock or livestock product	Unit of measure	Quantity [a]
Number of geese	Total[b]	3,930.0
	Average[c]	53.8
Geese produced (kgs)	Total	17,955.0
	Per bird	4.6
Geese sold (kgs)	Total (n = 20)	9,215.0
	Average	460.8
Geese used in home (kgs)	Total (n = 60)	8,195.0
	Average	136.6
	Eggs	
Number of egg producers	Number	108
% of all farmers	%	16.4
Number of eggs produced	Total[b]	358,548
	Average[c]	3,382
Number of eggs sold	Total (n = 66)	147,700
	Average	2,237
Number of eggs used in	Total (n = 104)	208,948
home	Average	1,009
	Honey	
Number of honey producers	Number	14
% of all farmers	%	2.1

(Table 16 continued)

Livestock or livestock product	Unit of measure	Quantity [a]
Honey produced (kgs)	Total[b]	9,165.0
	Average[c]	654.6
Honey sold (kgs)	Total (n = 13)	8,715.0
	Average	670.4
Honey used in home (kgs)	Total (n = 8)	359.0
	Average	44.9

[a] Rabbits: 10 farmers raised 270 animals; 8 farmers on average produced 63 kg; 2 farmers on average sold 80 kg.

[b]Total = Total amount for those producers who raised animals, and produced, sold or used animal products in the home in the previous production year.

[c]Average = Average amount per producer who raised animals, and produced, sold or used animal products in the home in the previous production year.

Farmers were also asked to report any other livestock they produced and the number of "head" of each. The number of head of other livestock species raised in the previous production year and the quantities of products produced are shown in Table 17.

Table 17.
Number of head of other livestock raised and quantities of products produced by private farmers in Three Selected Oblasts in Ukraine

Other livestock	Number of head	Quantity of product
Bee hives (families)	110	---
Horses	4	---
Ostrich	6	600 kg ostrich meat
Sheep	79	45 centners lamb meat

(Table 17 continued)

Other livestock	Number of head	Quantity of product
Turkey	55	180 kg turkey meat
Young pigs	28	---

Production and Disposal of On-farm Products

Farmers were also asked if they produced any finished products on their farm. Products made on the farm were reported by a small percentage of the participating farmers (5.6% or less). The product reported by the largest number of respondents was Flour (n = 37, 5.6% of total participants). The mean number of centners sold by these producers was 681.1 (see Table 18). The only other products made and sold in some substantial quantities were bran, sunflower oil, milk products, and canned vegetables, fruits, berries and juice (see Table 18).

Table 18.
Production and disposal of products made on the farm by private farmers in Three Selected Oblasts in Ukraine

Product[a]	Produced on farm			Sold from farm			Used in home		
	n/% farmers[b]	Quantity (centners)		n/% farmers	Quantity (centners)		n/% farmers	Quantity (centners)	
		Total	Av		Total	Av		Total	Av
Flour	37/5.6	25,200	681.1	32/4.9	5825	176.5	27/4.1	468	17.3
Bran	31/4.7	3754	121.1	13/2.0	2602	200.1	23/3.5	1319	57.3
Cereals	24/3.7	552	23.0	19/2.9	479	25.2	18/2.7	58	3.2
Bread	11/1.7	19964	1814.6	4/0.6	19936	4984.0	8/1.2	564	70.4
Sf oil[c]	23/3.5	2636	114.6	22/3.3	2592	117.8	9/1.4	42	4.6
Meat pr	35/5.3	1012	28.9	31/4.7	724	23.3	33/5.0	288	8.7
Milk pr	27/4.1	9263	343.1	26/4.0	8398	323.0	16/2.4	861	33.1

(Table 18 continued)

Product[a]	Produced on farm			Sold from farm			Used in home		
	n/% farmers[b]	Quantity (centners)		n/% farmers	Quantity (centners)		n/% farmers	Quantity (centners)	
		Total	Av		Total	Av		Total	Av
Canned[d]	10/1.5	2533	253.3	3/0.5	2510	836.7	9/1.5	24	2.5
Dry fruits	5/0.8	51	10.2	2/0.3	50	25.0	5/0.8	2	0.4

[a]Other products made: Oilcakes (1,230 centners); Chaff/husk/crushed grain (200 centners); Sugar (110 centners); Feed concentrate (80 centners).
[b]Total number of farmers=658.
[c] Sunflower oil.
[d]Canned vegetables, fruits, berries, juice.

Sale of Crop, Horticultural, and Livestock Products

Another aspect variable that was examined in this study was the types of agricultural products marketing that were used by the farmers in the previous year. A majority of farmers (n = 364, 55.3%) engaged in personal sales. A substantial number of the producers also reported using the marketing techniques of agribusiness companies (n= 289, 43.9%) and processors (n = 278, 42.2%) The other techniques reported are presented in Table 19.

Table 19.
Methods/outlets used to sell farm products by private farmers in Three Selected Oblasts in Ukraine

Sales method/outlet[a]	Number and % of farmers using sales method/outlet (N=658)	
	number	%[b]
Personal sale	364	55.3
Agribusiness company	289	43.9
Processor	278	42.2
Government organization/enterprise	227	34.5
Other farmers	166	25.2

(Table 19 continued)

Sales method/outlet[a]	Number and % of farmers using sales method/outlet (N=658)	
	number	%[b]
Wholesale dealer	74	11.2
Agricultural products stock exchange	65	9.9

[a]Other outlet: Supermarket (n = 1).
[b]Percentages do not total 100 since respondents were asked to indicate all that apply.

Cost of Inputs and Sources of Assistance

Each of the participating farmers in the study were also asked to report the inputs that were used in their farming operation in the previous year and the cost of the input. These data are presented in Table 20. The farming input that was reported as used by the largest number of study participants was seeds (n = 605, 91.9%). The mean cost of seeds reported was $3,133.40, which was also the largest input cost per producer. The input cost that was reported by the second largest number of producers was fuel (n = 593, 90.1%). However, the second highest mean input cost (mean based on the number reporting that cost) was salaries/wages ($2,694.20) (see Table 20).

It is interesting to note that 55.0% (n = 362) of farmers paid salaries/wages to permanent employees and 26.0% (n = 171) hired part-time/temporary labor to supplement permanent/family labor. This may indicate a trend toward cash transactions, which might signify a growth in business entrepreneurship. This is a healthy and positive sign for a privatized, market-based economic system (see Table 20).

Table 20.
Cost of Farm Production inputs used by private farmers in Three Selected Oblasts in Ukraine

Input	Number and percent of farmers		Reported cost ($)	
	Number	%	Total	Average
Seeds	605	91.9	1,895,701.0	3,133.4
Salaries/wages	362	55.0	975,296.0	2,694.2
Labor	171	26.0	444,927.0	2,601.9
Fuel	593	90.1	1,353,967.0	2,283.0
Livestock feed	169	25.7	371,371.0	2,197.4
Chemical fertilizers	556	84.5	890,412.0	1,601.4
Crop protection chemicals	447	67.9	513,421.0	1,148.5
Organic fertilizers	137	20.8	83,471.0	609.2

In addition to reporting the use and cost of the list of selected inputs in their farming operation, producers were also asked to indicate any other inputs that they used in their farming operation and the cost of those inputs. The "Other" input reported by the largest number of study participants was "Seedlings" (n = 14) with a total cost of $32,701.90. Other inputs used and their costs are indicated in Table 21. Only three of the other inputs were reported by more than one of the respondents (see Table 21).

Table 21.
Cost of other inputs used by private farmers in Three Selected Oblasts in Ukraine

Input	Reported cost (US $)
Seedlings (n = 14)	32,701.90
Machinery spares (n = 12)	11,308.90

(Table 21 continued)

Input	Reported cost (US $)
Machinery lease (n = 8)	3,154.70
Services (n = 1)	849.00
Transport (n = 1)	377.40
Geese (n = 1)	377.40
Tax (n = 1)	136.60
Combine threshing (n = 1)	56.60

Farmers who participated in the study were also asked to report the source of any assistance they received in the previous year regarding the purchase of agricultural inputs. The assistance source that was reported by the largest number of respondents was Center/Oblast Advisory Service (n = 333, 50.6%). Only one "Other" source was reported by more than 10% of the respondents, and that source was Agribusiness Companies (n = 110, 16.7%) (see Table 22).

Table 22.
Sources of input assistance to private farmers in Three Selected Oblasts in Ukraine

Source of input assistance	Number	Percent
Center/Oblast advisory service	333	50.6
Agribusiness companies	110	16.7
Agricultural board/department	38	5.8
Other farmers	28	4.3
Farmers Association	14	2.1
Compensation from state government	8	1.2
Collective enterprise	6	

Farm Planning

The following four tables (Tables 23 - 26) present information related to farm planning by agricultural producers participating in the study.

Respondents were asked to indicate whether or not they had developed written plans for their farming operation in each of three different areas. The type of written plans that were reported as developed by the largest group of respondents was Production plans (n = 462, 71.0%). In contrast, the smallest number of farmers (n = 132, 21.2%) indicated that they had developed Marketing plans. Almost half (n = 292, 46.0%) reported that they developed two or more of the three different types of plans identified in the study (see Table 23). This pattern is to be expected because the experience and comfort level of farmers is much greater for production operations than for business and marketing, which are more complex and subject to uncertainties of the marketplace.

Table 23.
Written plans for crop and livestock operations developed for and prior to the previous agricultural season by private farmers in Three Selected Oblasts in Ukraine

Type of plan	Number and percent of farmers Developing written plans		Not developing written plans		Total number of respondents	
	n	%	n	%	n	%
Production	462	71.0	189	29.0	651	100.0
Business	282	44.9	346	55.1	628	100.0
Marketing	132	21.2	492	78.8	624	100.0
Two or more	292	46.0	342	54.0	634	100.0

The proportion of farmers that did not prepare written plans is a matter of concern for program educators (see Table 23). To address this concern, study participants were asked to

report the reason that they did not prepare written plans. A total of 342 participating farmers responded to this question. The most frequently given reason for not preparing written plans was "Don't think plans are necessary" (n = 137, 40.1%). Almost one-fourth (n = 81, 23.6%) of those responding indicated that "Planning is too complicated." This information is presented in Table 24.

Table 24.
Reasons Cited by Private Farmers in Three Selected Oblasts in Ukraine for not Preparing Written Plans Prior to the Previous Season

Reason given	Number of respondents (N=342)	% of respondents (N=342)
Don't think plans are necessary	137	40.1
Planning is too complicated	81	23.6
Don't think plans are useful	40	11.7

Participating farmers who indicated that they did prepare one or more set of written plans (n = 536) were also asked to report whether or not they received assistance in preparing the plans. More than half (n = 300, 56.0%) indicated that they did receive assistance in preparing their plans (see Table 25).

Table 25.
Assistance received by Private Farmers in Three Selected Oblasts in Ukraine in Preparing Written Plans for the Most Recent agricultural season

Assistance received	Number of respondents	% of respondents
Yes	300	56.0
No (plans prepared by respondent)	236	44.0
Total	536	100.0

Finally, in the area of farm planning, respondents who indicated that they received assistance with their written plans were asked to report who assisted them. Raion/university specialists was the most cited source of help (92.0%) (see Table 26). Family members came next at 54.7% (n = 164), followed by other farmer/friend (n = 99, 33.0%). Nearly one-fifth (n = 53, 17.7%) of the respondents relied on an agricultural board representative. It is interesting that agricultural service cooperatives and private consulting companies were barely mentioned (n = 7, 2.3% and n = 3, 1.0% respectively) (see Table 26).

Table 26.
Persons Assisting Private Farmers in Three Selected Oblasts in Ukraine to Prepare Written Plans for the Most Recent Agricultural Season

Person assisting respondent	Number of respondents assisted (N=300)	% of respondents assisted (N=300)
Raion/university specialist	276	92.0
Family member	164	54.7
Farmer or friend	99	33.0
Agricultural board representative	53	17.7
Reformed collective farm staff	52	17.3
Agricultural service cooperative	7	2.3
Private consulting company	3	1.0

Note. Percentages do not total 100 since respondents were asked to select all that apply.

Agricultural Credit

Another area examined in the study was the utilization of credit by farmers participating in the study. The first question was whether or not the farmer took credit during the previous production season. Of the participants who responded to this question, 25.0% (n = 161) indicated that they did take credit (see Table 27).

The three-fourths of responding farmers who did not take agricultural credit in the previous production season were asked to specify the reason that they did not take agricultural credit in the previous production season.

Table 27.
Agricultural Credit Taken by Private Farmers in Three Selected Oblasts in Ukraine

Credit taken	Number and percent of farmers	
	n	%
Yes	161	25.0
No	482	75.0
Total	643	100.0

Note. 15 study participants did not respond to this question.

Three of the possible reasons provided to the participants were cited by a majority of respondents. These reasons included: "Interest rate was too high" (n = 294, 61.0%); Did not want to go into debt/take risk" (n = 290, 60.2%); and "Loan procedures were too complex" (n = 274, 56.8%) (see Table 28).

Table 28.
Reasons Given for not Taking Agricultural Credit in the Previous Production Season by Private Farmers in Three Selected Oblasts in Ukraine

Reason	Number of respondents (N=482)	% of respondents (N=482)
Interest rate was too high	294	61.0
Did not want to go into debt/take risk	290	60.2

(Table 28 continued)

Reason	Number of respondents (N=482)	% of respondents (N=482)
Loan procedures were too complex	274	56.8
Did not have collateral/security	211	43.8
Only short-term loan was available	207	42.9
Repayment amount was too large	202	41.9
Did not need	158	32.8
Loan was not available when I needed	154	32.0
Minimum loan was too high	128	26.6

Note. Percentages do not total 100 since respondents were asked to selected all that apply.

Farmers who took agricultural credit, were also asked to report selected information regarding their credit. The average loan amount for the participants in the study was just over $7,000.00 (n = 158, Mean = $7,243.30); the average annual interest rate was 20.1%; and the average length of all loans was 12.3 months (see Table 29).

Table 29.
Particulars of Agricultural Credit Taken by Private Farmers in Three Selected Oblasts in Ukraine

Particulars of credit	Number of respondents	Quantity	
		Total	Average
Value of all loans in the previous production year ($)	158	1,144,475.4	7,243.3
Interest rate of all loans (%/yr)	136	---	20.1

(Table 29 continued)

Particulars of credit	Number of respondents	Quantity	
		Total	Average
Length of all loans (months)	146	---	12.3

The most common source of agricultural credit reported was a bank (n = 117, 72.6% of respondents who took loans). Friends/family members were next most frequently reported as the source of credit (n = 41, 25.5%) (see Table 30).

Table 30.
Sources of Agricultural Credit Used by Private Farmers in Three Selected Oblasts in Ukraine

Credit source	Number of respondents (N=161)	% of respondents (N=161)
Bank	117	72.6
Friend/family member	41	25.5
Credit union	18	11.1
Agribusiness company	5	3.1

Farmers' Knowledge of Agricultural Best Management Practices (BMPs)

Participating farmers in the study were asked to provide information regarding their knowledge of Best Management Practices (BMPs) in the area of crop production. The information provided was self-reported level of knowledge of the BMPs. The BMP that was reported known by the largest percentage of farmers was "Controlling Weeds" (99.7%). All of the BMPs included in the survey were reported as known by the majority of respondents (see Table 31). The overall percentage of producers who reported that they knew the BMPs in the study was 92.7. This value was computed as the mean percentage of producers who reported that they knew the 14 BMPs in the survey. Of the 13 "Livestock Best Management Practices"

(BMPs) examined in the study, 12 were reported as known by the majority of respondents in the study.

Table 31.
Knowledge of Crop Best Management Practices (BMPs) Possessed by Private farmers in Three Selected Oblasts in Ukraine

Best management practice	Number of respondents	Percent of respondents who knew/ did not know recommendation		
		Knew	Did not know	Total
Controlling weeds	647	99.7	0.3	100.0
Planting recommended varieties	649	99.4	0.6	100.0
Using recommended seeding rate	649	99.4	0.6	100.0
Planting at right time	648	99.2	0.8	100.0
Controlling insects	645	99.1	0.9	100.0
Using correct row spacing	647	98.8	1.2	100.0
Harvesting properly	644	98.0	2.0	100.0
Using recommended fertilizers	647	97.2	2.8	100.0
Maintaining farm records	637	96.5	3.5	100.0
Following recommended crop rotation	645	95.7	4.3	100.0
Soil testing every three years	643	85.8	14.2	100.0
No-till planting	642	81.6	18.4	100.0
Using lime as recommended	641	78.6	21.4	100.0
Irrigating as needed	637	69.2	30.8	100.0
Overall	---	92.7	7.3	100.0

The BMP that was reported as known by the largest percentage of respondents was "Sanitary Housing Facility" (73.0%) followed closely by "Selecting or Buying Superior Stock" (72.6%) (see Table 32). The overall percentage of responding producers that reported that they knew the 13 BMPs was 62.8%.

Table 32.
Knowledge of livestock Best Management Practices (BMPs) Possessed by Private Farmers in Three Selected Oblasts in Ukraine

Best management practice	Number of respondents	Percent of respondents who knew/ did not know recommendation		
		Knew	Did not know	Total
Sanitary housing facility	370	73.0	27.0	100.0
Selecting or buying superior stock	269	72.6	27.4	100.0
Regular health check by veterinarian	370	70.8	29.2	100.0
Culling unproductive animals	364	69.0	31.0	100.0
Feeding balanced concentrate mixture	366	68.0	32.0	100.0
Up-to-date on required immunizations	364	65.7	34.3	100.0
Proper record-keeping	364	64.0	36.0	100.0
Using artificial insemination	365	63.0	37.0	100.0
Sanitary milking operations	363	60.1	39.9	100.0
Controlling internal/external parasites	361	57.3	42.7	100.0
Raising improved pastures	360	53.9	46.1	100.0
Practicing rotational grazing	358	50.3	49.7	100.0
Proper milking equipment/maintenance	359	48.7	51.3	100.0

(Table 32 continued)

Best management practice	Number of respondents	Percent of respondents who knew/ did not know recommendation		
		Knew	Did not know	Total
Overall	---	62.8	38.2	100.0

In addition to the crop and livestock BMPs, six "Environmental Best Management Practices" (BMPs) were examined in the study. A majority of responding farmers in the study indicated that they knew each of the environmental BMP's (see Table 33). Overall, the mean percentage of farmers who reported that they knew the environmental BMPs was 93.8.

Table 33.
Knowledge of Environmental Best Management Practices (BMPs) Possessed by Private Farmers in Three Selected Oblasts in Ukraine

Best management practice	Number of respondents	Percent of respondents who knew/did not know recommendation		
		Knew	Did not know	Total
Plant protection – cultural	638	98.6	1.4	100.0
Plant protection – chemical	638	98.4	1.6	100.0
Not burning post-harvest stubble	631	97.3	2.7	100.0
Handling animal sludge liquor	617	95.1	4.9	100.0
Plant protection – biological	629	87.3	12.7	100.0
Plant protection – cultural, chemical, biological	616	86.4	13.6	100.0
Overall	---	93.8	6.2	100.0

Adoption of Agricultural Best Management Practices (BMPs) by Farmers

The next section presents information on the adoption of recommendations associated with crop, livestock, and environmental best management practices (BMPs). Farmers who had knowledge of specific practices were asked to indicate the extent to which they followed the recommendations for those practices. A 5-point response scale was provided with ratings of 4 for always following recommendations, 3 for mostly following, 2 for sometimes following, 1 for rarely following, and 0 for not following. Farmers were placed into three categories according to their responses – full adopters if always or mostly following; partial adopters if sometimes following, and non-adopters if rarely following or not following. Percentages of farmers falling into these three categories were determined. In addition, the mean adoption score for each practice was calculated by summarizing and averaging scaled responses. Overall adoption percentages and the overall adoption means shown in the tables are for all practices in each of the three BMP groups (e.g. crop, livestock, and environmental).

Overall, 72.1% of farmers fully adopted recommendations for 14 crop BMPs. The range of adoption for this category of farmers was 98.9% to 18.5% (Table 34).

Table 34.
Adoption of crop production best management practices (BMPs) among Private Farmers in Three Selected Oblasts in Ukraine

Best management practice	Number of farmers[a]	Adoption Score[b]	Adoption category[c] (% farmers)			
			Full adopters	Partial adopters	Non adopters	Total
Using recommended seeding rate	643	3.6	98.9	1.1	0.0	100.0
Planting at right time	640	3.5	97.6	2.0	0.4	100.0
Harvesting properly	627	3.5	97.3	2.1	0.6	100.0
Using correct row spacing	637	3.5	96.0	3.5	5.5	100.0

(Table 34 continued)

Best management practice	Number of farmers[a]	Adoption Score[b]	Adoption category[c] (% farmers) Full adopters	Partial adopters	Non adopters	Total
Planting recommended varieties	644	3.3	92.5	6.4	1.1	100.0
Properly controlling weeds	643	3.3	92.4	7.0	0.6	100.0
Maintaining farm records	614	3.3	85.5	9.9	6.6	100.0
Properly controlling insects	638	3.2	86.0	9.2	4.8	100.0
Using recommended fertilizers	627	2.9	77.2	15.8	7.0	100.0
Following recommended crop rotation	615	2.9	73.0	20.0	6.2	100.0
No-till planting	523	1.9	45.5	18.0	36.5	100.0
Soil testing every three years	550	1.6	31.8	17.5	50.8	100.0
Using lime as recommended	502	1.1	19.9	14.5	65.5	100.0
Irrigating as needed	436	0.9	18.5	5.5	76.0	100.0
All BMPs (average)	595	3.0	72.1	9.5	18.4	100.0

[a]Farmers who said they knew different BMPs.
[b]Mean based on a 5-point rating scale with farmers indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).
[c]Full adopters – always or mostly followed practices; partial adopters – sometimes followed practices; non adopters – rarely or did not follow practices.

With regard to livestock BMPs, overall, 68.9% of farmers fully adopted the 13 practices included in this group. The range of full adoption was from 86.1% to 34.1% (Table 35).

Table 35.
Adoption of livestock production best management practices (BMPs) among Private Farmers in Three Selected Oblasts in Ukraine

Best management practice	Number of farmers[a]	Adoption score [b]	Adoption category [c] (% farmers)			
			Full adopters	Partial adopters	Non adopters	Total
Sanitary housing facilities	267	3.1	86.1	4.1	9.8	100.0
Sanitary milking operations	215	3.0	84.6	0.0	15.4	100.0
Regular health check by veterinarian	258	3.0	82.1	6.2	11.7	100.0
Up-to-date on required immunizations	236	3.1	80.5	8.5	11.0	100.0
Controlling internal/external parasites	205	2.9	77.0	8.8	14.2	100.0
Culling unproductive animals	250	2.9	76.4	9.6	14.0	100.0
Selecting/buying superior stock	263	2.8	75.0	11.8	12.2	100.0
Proper record-keeping	232	2.8	74.6	9.1	16.3	100.0
Using artificial insemination	228	2.7	68.9	8.8	22.3	100.0
Feeding balanced concentrate mixture	245	2.7	65.3	20.0	14.7	100.0
Proper milking equipment/maintenance	173	2.1	53.8	6.4	40.2	100.0
Raising improved pastures	192	1.7	37.0	12.5	50.5	100.0
Practicing rotational grazing	176	1.6	34.1	14.8	51.1	100.0
All BMPs (average)	226	2.7	68.9	9.3	21.8	100.0

[a]Farmers who said they knew different BMPs.
[b]Mean based on a 5-point rating scale with farmers indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).
[c]Full adopters – always or mostly followed practices; partial adopters – sometimes followed practices; non adopters – rarely or did not follow practices.

The overall full adoption percentage of six environmental BMPs (73.6%) was slightly more than for BMPs in the other two groups. The adoption percentage range for environmental BMPs was 94.7% to 50.4% (Table 36).

Table 36.
Adoption of environmental Best Management Practices (BMPs) among Private Farmers in Three Selected Oblasts in Ukraine

Best management practice	Number of farmer [a]	Adoption score [b]	Adoption category [c] (% farmers)			
			Full adopters	Partial adopters	Non adopters	Total
Plant protection – cultural	626	3.3	94.7	4.6	0.7	100.0
Plant protection – chemical	625	3.3	90.9	7.4	1.7	100.0
Not burning post-harvest stubble	614	3.0	72.1	16.9	11.0	100.0
Handling animal sludge liquor	583	2.7	71.5	12.0	16.5	100.0
Plant protection – cultural, chemical, biological	531	2.5	61.8	18.8	19.4	100.0
Plant protection – biological	547	2.1	50.4	13.9	45.7	100.0
All BMPs (average)	588	2.8	73.6	12.3	14.1	100.0

[a]Farmers who said they knew different BMPs.
[b]Mean based on a 5-point rating scale with farmers indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).
[c]Full adopters – always or mostly followed practices; partial adopters – sometimes followed practices; non adopters – rarely or did not follow practices.

The fact that significant percentages of farmers were in the partial and non-adopter categories for several specific BMPs in all three groups (crop, livestock, and environmental) should concern extension educators. It would be important for them to focus programming efforts to increase the adoption level of those practices.

Mean adoption scores are an alternative and convenient way of analyzing and interpreting data. They provide essentially the same information as percentages on an adoption continuum. Mean

scores from 2.5-4.0 can be interpreted as full adoption; scores from 1.5-2.49 indicate partial adoption, and scores below 1.5 suggest non-adoption. According to this interpretive scale, four crop BMPs require program educators' attention, i.e, no-till planting, soil testing every three years, using lime as recommended, and irrigating as needed. Three livestock BMPs, namely proper milking equipment/maintenance, raising improved pastures, and practicing rotational grazing, and one environmental BMP, biological plant protection, should receive the same educational focus.

Farmers' Agricultural Production Performance

Information regarding the agricultural production levels of the farmers in the study are presented in Table 37. Data presented in the table are organized by major categories of production (e.g. Crops, Milk, etc.).

Table 37.
Agricultural Production Levels of Private Farmers in Three Selected Oblasts in Ukraine

Production Indicator	Measure	Previous Production Year
	Crops [1]	
Area harvested – total	Hectares	36,828.5
Area harvested – average/producer	Hectares	26.3
Amount produced – total	Centners	1,710,087.2
Amount produced – average/producer	Centners	1,276.2
Amount sold – total	Centners	1,493,107.7
Amount sold – average/producer	Centners	1,265.4
	Milk [2]	
Amount produced – total	Centners	46,865.0

(Table 37 continued)

Production Indicator	Measure	Previous Production Year
Amount produced – average/producer	Centners	366.1
Amount sold – total	Centners	41,316.0
Amount sold – average/producer	Centners	338.6
	Beef, pork, poultry	
Amount produced – total	Centners	6,846.0
Amount produced – average/producer	Centners	15.8
Amount sold – total	Centners	5,530.6
Amount sold – average/producer	Centners	21.7
	Eggs	
Number sold – total	Number	140,450
Number sold – average/producer	Number	2,194
	Other indicators	
Credit used	# of farmers	124
Credit used – total	$ (US)	907,437.0
Credit used – average/farmer	$ (US)	7,318.0
Farm buildings – area/farmer	sq. meters	2,491.0
New farm equipment acquired	% farmers	31.3
Organized markets used [3]	% production	76.1
Written farm plans developed [4]	% farmers	47.0

(Table 37 continued)

Production Indicator	Measure	Previous Production Year
Information Support System used [5]	% farmers	83.9
Knowledge of BMPs [6]	% farmers	85.1
Use of BMPs [7]	% farmers	74.5

[1]Wheat, barley, buckwheat, rye, corn, sugar beet, potatoes, vegetables (carrots, cabbage, cucumbers, tomatoes, onions), fruits (apples, plums).
[2]A number of farmers who took over the former collectives and had large herds were a part of the survey.
[3]Legitimate market outlets that allow sellers to enter a retail chain and obtain a tax receipt Examples include Farmers market, Farm store, Bread Ukraine wholesale company, Retail buyers, Stock exchange, Processing company, Auction, Fair, Government agency.
[4]Production, business, marketing plans.
[5]Help in solving problems in agricultural operations .
[6]Farmers who knew recommendations of crop BMPs (14) and livestock BMPs (13).
[7]Farmers who "always" or "mostly" followed recommendations of crop BMPs (14) and livestock BMPs (13).

Additionally, income data relative to the various production measures are presented in Table 38. Income data indicated that Green forage income had the highest per producer income value (Mean = $30,197.37) followed by corn ($24,786.15), wheat ($20,548.43), and Sunflower ($12,279.14). It should be noted, however, that some of the highest per producer numbers were associated with products representing a small number of producers (e.g. Green Forage which was produced by only 57 of the participating farmers).

Among horticulture crops, apples came on top of highest income product. Income average for apple was 25,689.10 dollars followed by cabbage – 23,666.09 dollars, tomatoes – 18,422.00 dollars and potato – 15,217.97 dollars. The lowest income was recorded for plums – 801.89 dollars (see Table 38).

Table 38.
Crop Income data of Private Farmers in Three Selected Oblasts in Ukraine

Income Source	n	Mean(SD) ($)	Range ($)
Barley	455	11,577.64(24292.00)	228.60 – 243,840.00
Wheat	448	20,548.43(46349.00)	320.40 – 530,796.00
Buckwheat	228	3,748.98(3954.30)	203.40 – 20,566.00
Corn	185	24,786.15(44572.02)	195.00 – 346,970.00
Soybean	152	6,658.55(13517.32)	8.00-114,400.00
Sunflower	135	12,279.14(20602.27)	209.00 – 137,313.00
Rye	58	7,601.13(17080.01)	87.55 – 108,150.00
Green Forage	57	30,197.37(103336.02)	129.60 – 719,280.00
Potato	48	15,217.97(20384.01)	543.60 – 126,840.00
Cabbage	22	23,666.09(21100.68)	1,317.00 – 70,240.00
Tomatoes	21	18,422.00(567850.53)	1,320.90 – 2,641,800.00
Carrots	14	11,813.59(8992.42)	4,350.00 – 38,958.00
Onions	13	6,430.58(6070.42)	127.50 – 17,000.00
Cucumbers	12	14,390.39(13414.80)	1,557.00 – 41,520.00
Apples	8	25,689.10(58377.79)	422.80 – 169,120.00
Plums	3	801.89(531.57)	471.70 – 1,419.10
Strawberry	0	-	-
Total	636	47,953.93(158239.49)	347.10 – 2,641,800.00

Livestock income data indicated that milk had the highest income average - 4,089.94 dollars followed by income from beef cattle - 2,539.14 dollars, swine income - 1,642.45 dollars. The lowest income average has been recorded on ducks – 87.5 dollars (see Table 39).

Table 39.
Animal Income data of Private Farmers in Three Selected Oblasts in Ukraine

Income Source	n	Mean(SD) ($)	Range ($)
Swine	188	1,642.45(6917.07)	21.93 – 87,720.00
Milk	137	4,089.94(18207.00)	118.20 – 178,718.40
Eggs	106	202.95(134.22)	19.00 – 900.00
Chicken	102	113.32(91.49)	13.00 – 650.00
Beef Cattle	79	2,539.14(8276.26)	122.00 – 58,804.00
Geese	61	323.78(937.72)	33.00 – 6050.00
Ducks	51	87.50(108.97)	16.50 – 770.00
Horses	14	1963.93(3880.29)	90.00 – 15,000.00
Livestock Total	236	4,891.84(23,304.77)	15.00 – 307,918.40

Objective Three Results

Objective three was to determine the influence of selected factors on Ukrainian farmers' productivity as measured by the variable gross farm income. Demographic and agricultural farming characteristics of the farmers included:

a. Age
b. Gender
c. Educational Level
d. Numbers of family members involve in farming
e. Full time farming
f. Farming as major source of income
g. Participation in agricultural associations
h. Years of Farming

i. Size of agricultural land under crops

j. Size of agricultural land under garden

k. Size of agricultural land under green forage

l. Invested amount for agricultural inputs

To accomplish this objective a multiple regression analysis was performed. This was accomplished using as the dependent variable calculated gross income from all agricultural products produced, including products that used for personal consumption minus all expenditures associated with the production of these agricultural products. All expenditures included amounts spent on agricultural inputs, labor hired, and farm management. Calculation of gross income and expenditures for inputs was done in hryvnia and converted into U.S. dollars based on current currency rate. The other variables, demographic and farming characteristics, were treated as independent variables and stepwise entry of the variables was used due to the exploratory nature of the study. In the regression equation variables were added that increased the explained variance by one percent or more as long as the overall regression model remained significant.

Analysis of major factors affecting calculated gross income

The first step in conducting the regression analysis was to examine the bivariate correlations. Two-way correlations between factors used as independent variables and "calculated gross income" are presented in Table 40.

Three variable related to the size of agricultural land were found to be statistically significant. The highest correlations with "calculated gross income" were found to be "size of agricultural land under garden" ($r = .509$, $p < .001$) followed by "size of agricultural land under crops" ($r = .494$, $p < .001$) and "size of agricultural land under green forage" ($r = .203$, $p < .001$).

Table 40.
Relationship Between Selected Demographic and Farming Characteristics and "Total Gross Income" of Ukrainian farmers in Three Selected Oblasts in Ukraine

Variable	r	P <
Age[a]	.034	.212
Gender	-.021	.305
Educational Level	.086	.021
Number of family members involved in farming	.002	.485
Full time farming	-.078	.031
Major source of income	-.077	.034
Participation in agricultural associations	-.072	.043
Years of Farming	-.025	.272
Size of agricultural land under crops	.494	<.001
Size of agricultural land under garden	.509	<.001
Size of agricultural land under green forage	.203	<.001
Invested amount for agricultural inputs	-0.99	<.001

Note. n = 570.
[a] Age variable was originally recorded in number of years and recoded into five age categories – "30 and under", "31-40", "41-50", "51-60" and "over 60".

Table 41 presents the results of the multiple regression analysis utilizing "Calculated gross income" as the dependent variable.

The variable which entered the regression model first was the "Size of agricultural land under green forage." Considered alone, this variable explained 25.9% of the variance in "Calculated Gross Income" scores of Ukrainian farmers.

Two additional variables explained an additional 15.9% of the variance in "Calculated Gross income" scores. These variables included "Size of agricultural land under crops" (R Square = .414 p <0.001) and "Invested amount for agricultural inputs" (R Square = .421 p=0.010).

Table 41.
Multiple Regression Analysis of "Calculated Gross Income" Scores and Selected Demographic and Faming characteristics of Ukrainian farmers from Three Selected Oblasts in Ukraine

ANOVA

Source of Variation	Sum of Squares	df	Mean Square	F	p
Regression	5.957E+12	3	1.986E+12	137.314	<.001
Residual	8.185E+12	566	14460752382		
Total	1.414E+12	569			

Model Summary

Model	R	R Square	R Square Change	F Change	Sig. F Change	Standardized Coefficients Beta
Size of agricultural land under garden	.509	.259	.259	198.203	<.001	.421
Size of agricultural land under crops	.644	.414	.156	150.771	<.001	.403
Invested amount for agricultural inputs	.649	.421	.007	6.683	.010	-.083

Variables not in the Equation

Variables	t	p
Age	.899	.369
Gender	.070	.944
Educational Level	.464	.643
Numbers of family members involve in farming	-.288	.774

(Table 41 continued)

Variables	t	p
Full time farming	-.250	.803
Major source of income	.008	.993
Participation in agricultural associations	-.518	.604
Years of Farming	.-618	.537
Size of agricultural land under green forage	1.784	.075

Variables such as “Educational Level,” “Years of farming,” “Full time farming” did not enter the regression model.

CHAPTER 5.
SUMMARY, CONCLUSIONS, IMPLICAIONS, & RECOMMENDATIONS

Summary

Agricultural production is still playing a major role among countries in the world. Each country has a unique agricultural production, and to understand agricultural production specifics and know how to educate producers are most vital approaches for successful agricultural support programs. Knowing critical factors that have influence on agricultural production have become very important factors for developing and implementing educational programs for farmers.

Purpose statement

The purpose of this study was to use evaluation data from Ukrainian-American Extension Project to describe Ukrainian farmers' demographic characteristics, farming experience and management skill, farming production characteristics and agricultural products marketing methods. Besides that, this study examined the influence of selected demographic and production factors on farming productivity as measured by farming gross income from agricultural production of crops and livestock.

Objectives

The following specific objectives were developed to help in accomplishing the purpose of the study.

1: Describe Private Farmers in Selected Oblasts in Ukraine on the following personal demographic characteristics: age, gender, educational level, land and farming characteristics.

2: Describe agricultural production and marketing data of Private Farmers in Selected Oblasts in Ukraine.

3: Use Multiple Regression analysis to determine major factors impacting agricultural production of Ukrainian Farmers in selected three Oblasts.

Summary of Methodology

Population and sample

The target population for the study was defined as private farmers in the Ukraine. The accessible population included private farmers in three selected oblasts in the Ukraine. The sample consisted of registered private farmers in the three oblasts selected for inclusion in the study. A total of 250 farmers were randomly selected in two of the oblasts and 150 in the other (due to the size of the population in the smaller sample) for personal interviews by the raion specialists. Lists of the populations of registered private farmers in the three oblasts were obtained from the respective oblast authorities. There were 1,128; 1,038; and 652 registered private farmers in the three oblasts included in the study. Random samples were drawn from these lists using a computerized random numbers table. Primary and alternate lists of sample respondents were prepared. If a farmer on the primary list refused to be interviewed or could not be found after two attempts by the raion specialist the next name on the alternate list was chosen.

Instrumentation

To collect the data for this study, a survey was designed based on the literature, and the survey was validated by a panel of experts. The survey was designed to collect information about Ukrainian farmers' personal attributes, their agricultural operations, including production, management, and marketing of cereal and horticultural crops and livestock products, farm assets, knowledge and adoption of agricultural best management practices.

Raion specialists took part in a one-day training session to learn personal interview techniques, become familiar with the survey instruments, and practice interviewing. In the

practice session, each raion specialist interviewed a fellow raion specialist to get the experience of a real-life encounter.

Summary of Findings

This study provided a detail description of private Ukrainian farmers in three selected oblasts in Ukraine including their major characteristics such as age, educational level, year of farming (farming experience), characteristics of their farming land including type of land ownership, available equipment for farming, participation in different associations. Besides that, this study provided information on data of farmers' production, agricultural product marketing, usage of agricultural inputs and farming best practices.

Based on descriptive data, the conclusion can be reached that most of the Ukrainian farmers are producing crop products such as wheat, barley, corn and sunflower. Much smaller numbers of farmers participated in commercial livestock production. A reduced number of farmers in livestock production impacted green forage production; only 61 farmers indicated green forage production, which is only 9.3% from total sample size.

Also, this study revealed that most of the farmers could not obtain a farming credit due to the high annual rate and complicated process of obtaining credit. Only 25% of farmers were able to receive credit for agricultural production. Lack of credit also reflected on farmers' investing level in agricultural inputs. The major inputs were seeds and fuel and the much less amount farmers spent on growing technology and agricultural equipment.

The third objective of this study indicated three major factors that influenced farmers' productivity. The first factor reflected the amount of land under garden. With increase of agricultural land under garden, farmers' gross incomes positively increase as well. The same findings were discovered with the amount of agricultural land under crops. The last factor, which

influenced farmers' gross income was amount spent on agricultural inputs. Increase on spending for farming inputs negatively impacted on gross income.

Conclusions

Based on analyzed data, Ukrainian farmers were normally distributed on age. Average for age is 45.8 years old which is approximately 10 years younger compared to 57.1 years old of American farmers *Putting the Age of U.S. Farmers in Perspective. (2013).* http://farmdocdaily.illinois.edu/2013/10/putting-age-us-farmers-perspective.html. Also, it is important to notice that 93 % of Ukrainian farmers that participated in this study have above high school diploma degree with the highest number (52%) in category with University degree. Most of the participated farmers indicated farming as full-time job - 87.2% and only 12.8 % specified farming as the part-time job. Also it's important to indicate that most of the farmers, 77.2 % belong to the Farmers association. Most common land ownership among Ukrainian farmers was in category of "Village council title" followed by the "leased" and "family land share."

Production data indicated that most of the farmers produced wheat (69.8%) and barley (69.6%) as major crop. The lowest number, 9.3% belong to the farmers that produced green forage, silage, hay that indicate on declining of livestock producers as well as horticulture producers (2.1%). Furthermore, approximately 24% of farmers indicated production of milk. From them 135 farmers sold their milk and 128 farmers produced milk for home use as well 13.1 % of farmers indicated they produce beef; from them 68 farmers produced for commercial purpose and 17 farmers for home use only. The highest numbers of livestock producers belong to the "Swine producers" category. Approximately 33% of farmers indicated swine production. Most of the farmers (183 producers) produced swine for the home use purpose and 162 farmers indicated commercial production. In the poultry category producers distributed among 19.1 % of

broilers group, 10.5% in ducks group, 10.9 % in geese group, 16.4% in egg producers group and 2.1% in honey group.

Based on data from the regression analysis, the biggest factor that increased agricultural production of Ukrainian farmers was size of the farming land. Both type of the land, horticulture and land under crops indicated significant increase of productivity and explained approximately 41% of regression model. The third significant factor was Invested amount for agricultural inputs. Therefore, educational level and farming experience did not contribute explained variance to farmers' agricultural productivity.

Discussion and recommendations

This research was conducted in three different Oblasts located in the central part of Ukraine. Additional studies need to be conducted with the complete population of Ukrainian farmers, specifically from west and east parts of the country.

Also, most of the participating farmers had mixed crop-livestock farming. This type of agricultural production made the accurate calculation of specific crop gross income per hectare very difficult due to the combined collected information about agricultural inputs. Further research needs to be done with more detail information about inputs or with a sample of farmers with narrow crop or livestock production to be able to determine optimum size of agricultural operation (owned and/or leased).

Moreover, the Ukrainian government should make agricultural credit more accessible to the farmers by reducing complexity of paper work, decreasing high interest rate and provide crop insurance for natural disasters. Besides that, the government should encourage more farmers to produce livestock products by establishing programs to help farmers to invest into livestock facilities and provide assistance in purchasing of young livestock. Establishing of agricultural

credit unions will increase credit accessibility among Ukrainian farmers and encourage farmers to seek educational programs on best farming management practices. Additionally, most farmers in this research indicated receiving assistance in educational programs from university and/or from raion extension office established by university through a Ukrainian – American project. The Ukrainian government should establish a university based extension system to provide educational farmers' outreach programs.

REFERENCES

Berry, R., & Cline, W. (1979). Agrarian Structure and Productivity in Developing Countries.

Bhalla, S., & Roy, P. (1988). Mis-Specification in Farm Productivity Analysis: The Role of Land Quality. Oxford Economic Papers, New Series, Vol. 40, No.1. pp. 55-73.

Bharadwaj, K. (1974). Production Conditions in Indian Agriculture. *Cambridge University Press.*

Bondar, A., & Lilje, B. (2002). Land Privatization in Ukraine. Retrieved from https://www.fig.net/pub/fig_2002/Ts7-6/TS7_6_bondar_lilje.pdf.

Carter, M. R. (1984). Resource Allocation and Use under Collective Rights and Labor Management in Peruvian Coastal Agriculture. *Economic Journal*. 94, pp. 826-846. Christiaensen, L. and L. Demery. (2007). *Down to Earth Agriculture and Poverty Reduction in Africa*, The World Bank Group.

Chambers, R. (1983). Rural Development: Putting the last first. Longman, Harlow.

Cline, W. (1970). Economic Consequences of a Land Reform in Brazil. Amsterdam: *North-Holland.*

Department for International Development Annual Reports (2004). Agriculture, Growth and Poverty Reduction.
Retrieved from http://www.dfid.gov.uk/Documents/publications/agri-poverty-reduction.pdf.

Gille, V. (2011). Education spillovers in farm productivity: empirical evidence in rural India. *Conference Paper, Proceedings of the German Development Economics Conference*, Berlin 2011, No. 31.

Goetz, R. U., & Zilberman, D. (2007). The economics of land-use regulation in the presence of an externality: A dynamic approach. *Optimal Control Applications and Methods* 28:21-43.

Feder, G., Willett, A., & Zijp, W. (2001). "Agricultural Extension: Generic Challenges and the Ingredients for Solutions. Knowledge Generation and Technical Change: Institutional Innovation in Agriculture. Boston, Mass: Kluwer.

Fuglie, K. O., MacDonald, J. M., & Ball, E. (2007). Productivity Growth in U.S. Agriculture. Retrieved from http://www.ers.usda.gov/media/201254/eb9_1_.pdf.

Hanson, J., Dismukes, R., Chambers, W., Greene, C., & Kremen, A. (2004). Risk and risk management in organic agriculture: views of organic farmers. *Renewable Agriculture and Food Systems* 19:218-227.

Hanstad, T. (1998). Are Smaller Farms Appropriate for Former Soviet Republics? Rural Development Institute Report #97. Retrieved from http://www.landesa.org/wp-content/uploads/2011/01/RDI_097.pdf.

Hardie, I. W., Parks, P. J., & van Kooten, G. C. (2004). Land use decisions and policy at the intensive and extensive margins. Pages 101-139 in T. Tietenberg and H. Folmer,editors. *International Yearbook of Environmental and Resource Economics 2004/2005*. Edward Elgar, London, U.K.

Helfand, S. (2003). Farm size and the determinants of productive efficiency in the Brazilian Center-West, 25th International Conference of Agriculture Economists (IAAE), ISBN Number: 0-958-46098-1.

Kausar, Y. (2011). Impact of educated farmer on Agricultural Product. *Journal of Public Administration and Governance* 1, 158-164.

Keyzer, M. A., Merbis, M. D., Witt, R., Heyets, V., Borodina, O., & Prokopa, I. (2012). Farming and rural development in Ukraine: making dualisation work. JRC Scientific and Policy Report. Retrieved from http://agrilife.jrc.ec.europa.eu/documents/UkraineTechnicalReport.pdf.

Knowler, D., & Bradshaw, B. (2007). Farmers' adoption of conservation agriculture: a review and synthesis of recent research. *Food Policy* 32:25-48.

Leemans, R., & Born, G. J. (1994). Determining the potential distribution of vegetation, crops and agricultural productivity. *Water, Air, and Soil Pollution* 76:133-161.

Loomis, R. S., Williams, W. A., & Hall, A. E. (1971). Agricultural productivity. *Annual Review of Plant Physiology* 22:431-468.

Macours, K., & Swinnen, J. (1997). Causes of Output Decline in Economic Transition: The Case of Central and Eastern European Agriculture, Policy Research Group Working Paper-11, Department of Agricultural Economics, Katholieke Universiteit Leuven.

Mazumdar, D. (1965). Size of Farm and Productivity: A Problem of Indian Peasant Agriculture. Economica, New Series, Vol. 32, No. 126, pp. 161-173 doi:10.2307/2552546.

McCann, E., Sullivan, S., Erickson, D., & de Young, R. (1997). Environmental awareness, economic orientation, and farming practices: a comparison of organic and conventional farmers. *Environmental Management* 21:747-758.

McMillan, J., Whalley, J., & Zhu, L. (1989). The Impact of China's Economic Reforms on Agricultural Productivity Growth. *Journal of Political Economy* 97(4), pp. 781-807.

Mishchenko, N., & Gumeniuk, K. (2006) Agro-ecological assessment for the transition of the agricultural sector in Ukraine. Interim Report IR-06-052. Retrieved from http://webarchive.iiasa.ac.at/Admin/PUB/Documents/IR-06-052.pdf.

Montagnini, F., & Nair, P. (2004). Carbon sequestration: an underexploited environmental benefit of agroforestry systems. *Agroforestry Systems* 61:281-295.

Nelson, R. R., & Phelps, E. S. (1966) 'Investment in humans, technological diffusion, and economic growth.' *American Economic Review* 56(1/2), 69–75.

Ravallion, M., & Chen, S. (2007). "China's (Uneven) Progress Against Poverty", *Journal of Development Economics*.

Rogers, E. M. (2003). *Diffusion of innovations*, 5th Edition. FreePress, New York, New York, USA.

Sampath, R. (1992). Farm size and land use intensivity in Indian agriculture, Oxford Economic Papers, New series, Vol. 44, No.3, pp. 494-501.

Statistical Yearbook. Social and economic characteristics of households in Ukraine in 2010. State Statistics Service of Ukraine, 2010. Retrieved from http://ukrstat.org/uk/operativ/operativ2010/gdn/sdh/dod_08.htm.

Stoorvogel, J. J., Antle, J. M., Crissman, C. C., & Bowen, W. (2004). The tradeoff analysis model: integrated bio-physical and economic modeling of agricultural production systems. *Agricultural Systems* 80:43-66.

Teryomenko, H. (2008). Farmsize and Determinants of Agricultural Productivity in Ukraine. National Academy of Sciences of Ukraine.

Uchida, E., Rozelle, S., & Xu, J. (2009). Conservation payments, liquidity constraints, and off-farm labor: impact of the Grain-for-Green program on rural households in China. *American Journal of Agricultural Economics* 91:70-86.

Umali, D. L., & Schwartz, L. (1994). Public land private agricultural extension: Beyond traditional frontiers. Washington, D.C.: The World Bank.

United Nations. (1996). Land Administration Guidelines with Special Reference to countries in Transition. Retrieved from http://www.unece.org/fileadmin/DAM/hlm/documents/Publications/land.administration.guidelines.e.pdf.

World Bank's Report. (2008). Agriculture for Development. Retrieved from http://siteresources.worldbank.org/INTWDR2008/Resources/WDR_00_book.pdf.

World Bank's Report. (2010). Agricultural & Rural Development Notes. Gender and Governance in Agricultural Extension Service: Insights from India, Ghana, and Ethiopia. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/9460/565820BRI0Box31ARD1GandG1Note531web.txt?sequence=2.

Zyl, J., Miller, B. R., & Parker, A. (1996). Agrarian Structure in Poland: The Myth of Large-Farm Superiority. World Bank Policy Research Working Paper 1596.

APPENDIX A.

MAP OF UKRAINE

APPENDIX B.
FARMERS SURVEY UKRAINIAN VERSION

Farmers' Survey Key

SN

Анкета № 001–

center

① Черкаський центр / ② Хмельницький центр / ③ Вінницький центр
(Обвести)

РОЗДІЛ І. ІНФОРМАЦІЯ ПРО ФЕРМЕРА, ЙОГО СІМ'Ю, СІЛЬСЬКОГОСПОДАРСЬКЕ ВИРОБНИЦТВО

Індивідуальний власник

N1 1. Прізвище, ім'я та по-батькові вкажіть прізвище, ім'я та по-батькові.

N2 2. Село вкажіть назву

N3 3. Район вкажіть назву

Деяка інформація про фермера та його сім'ю

Q11 1.1. Вік на момент опитування: вкажіть число (років)

Q12 1.2. Стать:

Чоловіча	1
Жіноча	2

Q13 1.3. Яка у вас освіта (вказати найвищу) і спеціальність / спеціалізація? (Заповнюється лише одна графа)

Освіта	*Вказати (х)*	*Спеціалізація (вкажіть) – наприклад: сільське господарство, педагогіка, медицина, машинобудування, зварювання, теслярська справа і т.д.*
8-річна школа	1	xxx
Середня школа	2	xxx
Професійне училище	3	вкажіть спеціалізацію для
Технікум / коледж	4	вибраного номера та надайте
Вищий навчальний заклад (спеціаліст/бакалавр)	5	номер для категорії
Магістр	6	
Кандидат наук	7	
Інше (*вказати) вкажіть лист.		вкажіть лист

1.4. Хто із членів вашої сім'ї постійно чи час від часу з вами проживає нині, ким вони вам доводяться, їх вік та освіта; вони вам допомагають у веденні господарства?

	Член родини	*Ким доводиться (дідусь/бабуся, батько/мати, чоловік/дружина, дитина і т. ін.)*	*Вік (років)*	*Допомагає по господарству*		
				Так	*Ні*	
Q14_A	#1	1. батьки / дідус. / бабус.	Q14_A1	1	2	Q14_A2
Q14_B	#2	2. чоловік / дружина	Q14_B1	1	2	Q14_B2
Q14_C	#3	3. Діти	Q14_C2	1	2	Q14_C2
Q14_D	#4	4. Інші родичі.	Q14_D1 (число)	1	2	Q14_D2.

Q14_C1

Q14_E | #5 | | Q14_E1 | 1 | 2 | Q14_E2

Q15 1.5 Який відсоток Вашого сукупного доходу складає дохід від продажу виробленої вами сільськогосподарської продукції?

Дохід (%)	*Навпроти відповідної стрічки поставте (x)*
0-25%	1
26-50%	2
51-75%	3
76-100%	4

Q 16 1.6. Чи наймали ви робітників у 2003, які допомагали виконувати роботи у вашому господарстві?

Так	1
Ні	2

Q 161 1.6.1. ЯКЩО ТАК, то скільки їх було у Вас у 2003 році (незалежно від того, упродовж якого періоду вони працювали)?

вкажіть число (кількість найманих працівників)

1.7. Чи є ви членом асоціацій чи організацій вашої громади, району чи області?
(Поставте ТАК або НІ нижче)

	Назва організації / групи	*Так*	*Ні*
Q17_A	Асоціація фермерів (товаровиробників)	1	2
Q17_B	Асоціація жінок	1	2
Q17_C	Громадська чи соціальна група	1	2
Q17_D	Сільськогосподарський кооператив	1	2
	Інше (вкажіть) категорії та номер кат.		xxx

1.7.1. Якщо ви є членом однієї чи кількох асоціацій або організацій, згаданих вище, яка, на вашу думку, користь від участі в їх діяльності? (зазначте "так" чи "ні" для кожного варіанту відповіді).

	Користь	*Так*	*Ні*
Q171_A	Підтримка політичних рішень	1	2
Q171_B	Отримання та розповсюдження інформації	1	2
Q171_C	Придбання засобів виробництва	1	2
Q171_D	Продаж сільськогосподарської продукції	1	2
Q171_E	Допомога в господарюванні й управлінні	1	2
	Інше (вкажіть) категорії та номер		xxx

Стан сільськогосподарського виробництва

Q21 2.1. Коли ви почали виробляти сільськогосподарську продукцію на своїй присадибній ділянці?

_____ (рік)

Q22 2.2. Загальна площа землі, що обробляється: _____ (га)

2.3. Скільки гектарів землі Ви використовуєте (вкажіть реальне число, якщо ж не використовуєте „0"):

	Тип використання	*Розмір в сотках*
Q23_A	Рілля	
Q23_B	Фруктовий сад	
Q23_C	Сінокіс/сіножать	
Q23_D	Теплиця	
	Інше (вкажіть)	

2.4. Кількість та розмір різних ділянок на Вашій землі, віддаленість цих ділянок від Вашого помешкання, як Ви отримали ці ділянки?

	Ділянка	*Розмір (га)*	*Віддаленість від Вашої домівки (км)*	*Як отримано ділянку*				
				Державний акт на право користування землею	*Орендовано*	*Придбано*	*Земельні паї членів родини*	
Q24_A	#1 1	Q24_AA	Q24_AB	1	2	3	4	Q24_AC
Q24_B	#2 2	Q24_BA	Q24_BB	1	2	3	4	Q24_BC
Q24_C	#3 3	Q24_CA	Q24_CB	1	2	3	4	Q24_CC
Q24_D	#4 4	Q24_DA	Q24_DB	1	2	3	4	Q24_DC
Q24_E	#5 5	Q24_EA	Q24_EB	1	2	3	4	Q24_EC

2.5. Що Ви можете сказати про якість ґрунтів усіх ділянок?

Q25

Якість ґрунтів усіх ділянок	*Позначте (х) тільки щось одне*
Хороша	1
Посередня	2
Погана	3

2.6. Які сільськогосподарські культури Ви вирощували у 2003 році, скільки гектарів, який був загальний валовий збір, скільки продано, спожито для власних потреб, використано як фураж, насіння?

	Сільськогосподарські культури	*Вирощувалось у 2003 році*		*Площа в га у 2003*	*Вироблено, продано, використано продукції у 2003 році (т)*				
		Так	*Ні*		*Зібрано*	*Продано*	*Використано на*		
							власні потреби	*фураж*	*насіння*
WH	Пшениця	1	2	WH_A	WH_B	WH_C	WH_D	WH_E	WH_F
BA	Ячмінь	1	2	BA_A	BA_B	BA_C	BA_D	BA_E	BA_F
Bu	Гречка	1	2	Bu_A	Bu_B	Bu_C	Bu_D	Bu_E	Bu_F
CO	Кукурудза	1	2	CO_A	CO_B	CO_C	CO_D	CO_E	CO_F

RY	Жито	1	2	RY_A	RY_B	RY_C	RY_D	RY_E	RY_F
SB	Цукрові буряки	1	2	SB_A	SB_B	SB_C	xxx	xxx	xxx
FB	Кормові буряки	1	2	FB_A	FB_B	FB_C	xxx	FB_E	xxx
GF	Посіви на зелений корм, силос, сіно	1	2	GF_A	GF_B	GF_C	xxx	GF_E	xxx
SF	Соняшник	1	2	SF_A	SF_B	SF_C	SF_D	xxx	SF_F
PO	Картопля	1	2	PO_A	PO_B	PO_C	PO_D	xxx	PO_F
CA	Морква	1	2	CA_A	CA_B	CA_C	CA_D	xxx	xxx
CB	Капуста	1	2	CB_A	CB_B	CB_C	CB_D	CB_E	CB_F
CU	Огірки	1	2	CU_A	CU_B	CU_C	CU_D	CU_E	CU_F
TO	Помідори	1	2	TO_A	TO_B	TO_C	TO_D	TO_E	TO_F
ON	Цибуля	1	2	ON_A	ON_B	ON_C	ON_D	ON_E	ON_F
AP	Яблука	1	2	AP_A	AP_B	AP_C	AP_D	AP_E	AP_F
PL	Сливи	1	2	PL_A	PL_B	PL_C	PL_D	PL_E	PL_F
ST	Полуниці	1	2	ST_A	ST_B	ST_C	ST_D	xxx	xxx
FT	Саджанці	1	2	FT_A	FT_B	FT_C	FT_D	FT_E	FT_F
	Інше (вкажіть)								

Q27 2.7. Чи маєте Ви теплицю на присадибній ділянці?

Так	1
Ні	2

2.8. Яких тварин Ви вирощували у 2003 році, скільки голів, скільки вироблено тваринної продукції, продано, використано для власних потреб (спожито)?

	Сільськогосподарські тварини чи продукція	*Вирощено / вироблено у 2003 році*		*Кількість голів(в середньому) у 2003 році*	*Одиниць продукції*	*Скільки вироблено, продано й спожито у 2003 році*		
		Так	*Ні*			*Вироблено*	*Продано*	*Використано для власних потреб*
HR	Коні	1	2	HR_A	#	HR_B	HR_C	HR_D
MC	Дійні корови	1	2	MC_A	т молока	MC_B	MC_C	MC_D
BC	ВРХ на відгодівлю	1	2	BC_A	ц яловичини	BC_B	BC_C	BC_D
SG	Вівці та кози	1	2	SG_A	кг	SG_B	SG_C	SG_D
BS	Свиноматки	1	2	BS_A	#	BS_B	BS_C	BS_D
SW	Свині на відгодівлю (свинина)	1	2	SW_A	ц свинини	SW_B	SW_C	SW_D
CH	Кури (бройлери)	1	2	CH_A	кг	CH_B	CH_C	CH_D
DU	Качки	1	2	DU_A	кг	DU_B	DU_C	DU_D
GE	Гуси	1	2	GE_A	кг	GE_B	GE_C	GE_D
EG	Яйця	1	2	xxx	#	EG_B	EG_C	EG_D
RA	Кролі	1	2	RA_A	кг	RA_B	RA_C	RA_D
FA	Хутряні тварини	1	2	FA_A	#	FA_B	FA_C	FA_D
FR	Хутро	1	2	FR_A	кг	FR_B	FR_C	FR_D
	Інше (вкажіть)							

Таблиця НРО Q29_ Q73.

2.9. Які будівлі Ви маєте на своїй присадибній ділянці для зберігання сільськогосподарської техніки та реманенту, утримання худоби, зберігання сіна та продукції рослинництва, вкажіть вік цих споруд та їх площу?

	Тип будівлі	*Так*	*Ні*	*Вік (роки)*	*Площа (кв. метри)*
Q29_A	Хлів або навіс для худоби	1	2	Q29_AA	Q29_AB.
Q29_B	Зерносховище / Критий тік для зерна	1	2	Q29_BA	Q29_BB.
Q29_C	Ангар	1	2	Q29_CA	Q29_CB.
Q29_D	Бункер	1	2	Q29_DA	Q29_DB.
Q29_E	Гараж	1	2	Q29_EA	Q29_EB.
Q29_F	Навіс для техніки та реманенту	1	2	Q29_FA	Q29_FB
Q29_G	Майстерня (механічна, столярна, і т.п.)	1	2	Q29_GA	Q29_GB.
Q29_H	Підвальні та підземні сховища для овочів та фруктів	1	2	Q29_HA	Q29_HB.
	Інше (вкажіть) лист.				

вкажіть вік та площу для кожного "інше"

Q210 2.10. Чи будували ви додаткові споруди за останні 2 роки?

Так	1
Ні	2

~~Таблиця НРО Q211~~

2.11. Які види техніки та обладнання Ви використовували протягом 2003 року на своїй присадибній ділянці, що з використаного було власним, орендованим, позиченим, використовувалось як спільна власність?

	Техніка й обладнання	*Використано у 2003р.*		*Власна техніка*	*Орендовано чи позичено за платню*	*Використано як спільна власність (безкоштовно)*
		Так	*Ні*	*Кількість*	*Кількість*	*Кількість*
Q211_A	Вантажний автомобіль	1	2	Q211_AA	Q211_AB	Q211_AC
Q211_B	Автомобіль	1	2	Q211_BA	Q211_BB	Q211_BC
Q211_C	Віз	1	2	Q211_CA	Q211_CB.	Q211_CC
Q211_D	Трактор	1	2	Q211_DA	Q211_DB	Q211_DC
Q211_E	Причіп (всі види)	1	2	Q211_EA	Q211_EB	Q211_EC.
Q211_F	Культиватори	1	2	Q211_FA	Q211_FB	Q211_FC
Q211_G	Саджалка	1	2	Q211_GA	Q211_GB	Q211_GC
Q211_H	Комбайни (всі види)	1	2	Q211_HA	Q211_HB	Q211_HC
Q211_I	Обприскувач	1	2	Q211_IA	Q211_IB	Q211_IC
Q211_K	Сівалка	1	2	Q211_KA	Q211_KB	Q211_KC
Q211_L	Доїльний апарат	1	2	Q211_LA	Q211_LB	Q211_LC
Q211_M	Кормоподрібнювач	1	2	Q211_MA	Q211_MB	Q211_MC
Q211_N	Культиватор з ручним приводом	1	2	Q211_NA	Q211_NB	Q211_NC
Q211_P	Косарка	1	2	Q211_PA	Q211_PB	Q211_PC
Q211_Q	Міні трактор	1	2	Q211_QA	Q211_QB	Q211_QC.
	Інше (вкажіть) лист					

вкажіть кількість для кожного "інше"

2.12. Які були ринки збуту виробленої Вами сільськогосподарської продукції у 2003 році?

	Ринок збуту	*Так*	*Ні*
Q212_A	Переробне підприємство	1	2

Q212B	Агро бізнес	1	2
Q212_C	Оптовий ділер	1	2
Q212_D	Товарна біржа	1	2
Q212_E	Урядова організація чи підприємство	1	2
Q212_F	Колишнє колективне господарство	1	2
Q212_G	Базар чи роздрібний продаж	1	2
Q212_H	Інші с.-г. виробники	1	2
Q212_I	Продав власноруч на роздрібному ринку	1	2
	Інше (вказати)		xxx

2.13. Яку кількість із вказаних нижче засобів виробництва ви використали для проведення усіх господарських операцій у 2003 році і скільки це коштувало? (Візьміть до уваги усе, що ви купили, придбали по бартеру чи виробили власноруч)

Засоби виробництва	*Одиниць кількості*[a]	*Скільки використано*	*Вартість у грн.*
Насіння	ц	Q213_A	Q213_AA
Корм для худоби	ц	Q213_B	Q213_BB
Органічні добрива	т	Q213_C	Q213_CC
Мінеральні добрива	ц	Q213_D	Q213_DD.
Засоби захисту	кг	Q213_E	Q213_EE
Пальне	л	Q213_F	Q213_FF.
Робота (постійна і тимчасова)	число	Q213_G	Q213_GG
Заробітна плата	xxx	xxx	Q213_HH.
Інше (вказати)		Q213_I	Q213_II.

[a] Якщо якісь інші одиниці вимірювання використовувалися для певного засобу виробництва, вкажіть це в першій колонці поруч із відповідним засобом виробництва.

2.14. Яку допомогу Ви отримали для придбання засобів виробництва у 2003 році, хто надав Вам цю допомогу?

Вид допомоги	*Отримано в 2003 році*		*Хто надав допомогу*
	Так	*Ні*	
Q214_A Інформація про постачальників засобів господарювання	1	2	вкажіть та надайте
Q214_B Інформація про використання засобів господарювання	1	2	номер категорії.
Q214_C Отримано фактично засобів господарювання	1	2	
Інше (вкажіть) мист та ном. категор.		xxx	

2.15. Якими з наступних методів менеджменту Ви використовуєте у своїй діяльності? (вкажіть "так" чи "ні" для кожного пункту)

Управлінський метод	*Так*	*Ні*
Q215_A Планування виробництва та збуту продукції в письмовій формі	1	2
Q215_B Ведення ділової документації по виробництву та збуту продукції в письмовій формі	1	2
Q215_C Аналіз виробництва в письмовій формі	1	2
Q215_D Визначення прибутковості у письмовій формі	1	2
Q215_E Планування та ведення документації використання найманої праці у письмовій формі	1	2
Q215_F Використання консультаційної допомоги для поліпшення управління виробництва	1	2
Q215_G Укладання контрактів зі споживачами до збирання урожаю та збуту продукції	1	2

Q215_H	Укладання контрактів з постачальниками до придбання сировини для виробництва	1	2

Q216 2.16. Чи брали Ви кредит для ведення сільськогосподарської діяльності у 2003 році?

Так	1
Ні	2

2.16.1. Якщо ТАК, вкажіть:

Характеристики кредиту	*Одиниця*	*Кількість*
Сума кредиту чи позики	гривні	Q2161_A
Процентна ставка	% (рік)	Q2161_B
Тривалість позики	місяці	Q2161_C.

2.16.2. Якщо ТАК, назвіть джерело кредиту? (позначте "так" чи "ні" для кожного джерела)

	Джерело кредиту	*Так*	*Ні*
Q2162_A	Банк	1	2
Q2162_B	Кредитна спілка	1	2
Q2162_C	Компанія агробізнесу	1	2
Q2162_D	Особиста позика, отримана від друга/члена родини	1	2
	Інше (вкажіть)		xxx

2.16.3. Якщо НІ, чому Ви не спромоглися отримати кредит? (вкажіть "так" чи "ні" для кожної причини)

	Причина, яка завадила отримати кредит	*Так*	*Ні*
Q2163_A	Відсутність необхідної застави	1	2
Q2163_B	Відсутність потреби	1	2
Q2163_C	Не хотів заходити у борг/занадто ризиковано	1	2
Q2163_D	Занадто висока процентна ставка	1	2
Q2163_E	Наявність лише короткострокової позички	1	2
Q2163_F	Обсяг мінімальної позички в кредитній установи був занадто високий	1	2
Q2163_G	Велика сума при поверненні позички	1	2
Q2163_H	Дуже складна процедура отримання позики	1	2
Q2163_I	Несвоєчасна видача позичка	1	2
	Інше (вкажіть) лист та номер категорії		xxx

APPENDIX C.
FARMERS SURVEY ENGLSIH VERSION

Part 1. Information about Farmers, his/her family and agricultural production.

Private Farmer:

1. Last Name, First Name and Middle Name:

   _____

2. Name of your Village _____
3. Name of your Rayon _____

Some information about Farmer and his/her family:

1.1 Your age during taking survey _____(your age in years)

1.2 Your Gender ____Male ___Female

1.3 Please indicate your education level and specialization if available:

Education	**Check one**	**Specialization (for example: agricultural, medical, engineering and etc.)**
8 years of school		xxx
High School		xxx
Vocational education		
College		
Bachelor Degree/Specialist		
Master Degree		

Ph. D		
Other		

1.4 Indicate which member of your family lives with you, also indicate type of relationship and their age:

Family Member	**Relationship (for example: grandfather/grandmother, father/mother, spouse, child and etc.)**	**Age (numbers of years)**	**Providing help on your Farm**	
			Yes	**No**
# 1				
# 2				
# 3				
# 4				
# 5				

1.5 Which percent of your annual family income belongs to gross income from farming?

Gross Income from Farming (%)	**Please check one**
0-25%	
26-50%	
51-75%	
76-100%	

1.6 Please indicate if you hired any employees for farming in last year

Answer	Please check one
Yes	
No	

1.6.1 If you answered "Yes" on the above question, please indicate number of hired employees below

_____(number of hired employees)

1.7 Do you belong to any organization/association at the village, rayon or oblast level?

Name of Organization	Yes	No
Farmer Association		
Women Association		
Village or social group		
Agricultural cooperative		
Other		
Indicate here if "Other":		

1.7.1 If you indicated "Yes" in one of Organization/Association question, please indicate which benefits you are receiving from indicated above Organization/Association:

Benefits	Yes	No
Support in political decisions		
Receiving and distributing information		

Purchasing of agricultural inputs		
Marketing of agricultural products		
Assistance in farming management		
Othe (Please Indicate)_____		

Status of agricultural production

2.1. Indicate when you started to produce agricultural products at your farm:

_____(please indicate an year)

2.2. Indicate size of cultivating land _____(hectors)

2.3. Indicate type of land used on your farm (please write 0 if you do not have specified below type of land at your farm):

Type of land	**Size (in hectors)**
Arable Land	
Garden Land	
Forage Land	
Land for Greenhouse	
Other (Please indicate) _____	

2.4. Indicate number, size and ownership of different pieces of agricultural land at your farm and how far from your major location:

Land pieces	**Size (in hectors)**	**Distance (in km)**	**Type of Ownership**			
			Title	**Lease**	**Purchased**	**Land from Family**

						member
#1						
#2						
#3						
#4						
#5						

2.5. Please indicate soil quality on your farming land:

Soil quality	**Please check one**
Very good	
Some good	
Bed	

2.6. Indicate which agricultural crops you have produce during last year. Provide size of land for specific crop, total produced (in tons), amount of harvested, sold amount and amount used for personal use.

Agricultural Crop	**Produced in last year**		**Area in hectors**	**Harvested, sold, used on the farm (in tons)**				
	Yes	**No**		**Harvested**	**Sold**	**Used for Farming**		
						Personal use	**Forage**	**Seeds**
Wheat								

Barley								
Buckwheat								
Corn								
Rye								
Sugar beet								
Feeding beet								
Green Forage								
Sunflower								
Potato								
Carrot								
Cabbage								
Cucumbers								
Tomatoes								
Onion								
Apple								
Plum								
Strawberry								
Sapling								
Other								
Please indicate other _____								

2.7. Do you have a green house on your farm?

Answer	Please check one
Yes	
No	

2.8. Which type of livestock you had in last year, list head count, produced livestock products, sold products and kept for the personal use.

Name of the Livestock	Produced in last year		Number of heads	Measuring units	Amount of Livestock products produced last year		
	Yes	No			Produced	Sold	Personal Use
Horse				#			
Milk Cow				Milk in tons			
Meet Cow				Beef in centers			
Sheep and goat				Kilograms			
Sow				#			
Swine				Centners			
Chicken				Kilograms			
Duck				Kilograms			
Geese				Kilograms			
Eggs				#			
Rabbit				Kilograms			

Furs Animal				#			
Furs				Kilograms			
Other							
Please indicate Other and measurement units _____							

2.9. Please indicate type of construction at your farm for machinery storage and/or service, livestock facilities, grain and/or forage storage. Indicate age and area of facilities.

Type of facility	**Yes**	**No**	**Age**	**Area (sq.meter)**
Cattle Shed				
Grain Storage				
Hangar				
Bunker				
Garage				
Shed for ag. machinery storage				
Service shop				
Vegetable and Fruit Storage				
Other				
Please indicate Other _____				

2.10. Have you build additional facilities in the past 2 years?

Answer	**Please check one**
Yes	
No	

2.11. Please indicate type of equipment that you used last year for the farming purposes. Specify your ownership of this equipment (own, lease, borrowed, shared ownership).

Type of Equipment	**Used last year**		**Own**	**Lease/borrowed**	**Shared**
	Yes	**No**	**#**	**#**	**ownership #**
Heavy duty truck					
Auto					
Cart					
Tractor					
Trailer					
Cultivator					
Seeding-machine					
Milking machine					
Feeding machine					
Hand cultivator					
Mowing machine					
Mini tractor					
Other					
Please indicate Other_____					

2.12. Indicate type of agricultural products marketing that you used last year.

Type of market	**Used last year**	
	Yes	**No**

Processing plant		
Agro business		
Bulk dealer		
Governmental organization and/or plant		
Former collective farm		
Local market, sold to the seller		
Other Agricultural producers		
Sold myself on the local market		
Other		
Please indicate Other _____		

2.13. Indicate which agricultural inputs you have used last year and cost of each input.

Agricultural Inputs	Units of measurements	Amount used last year	Cost (in hryvna)
Seeds		Centner	
Livestock feed		Centners	
Organic Fertilizer		Tons	
Mineral Fertilizer		Centners	
Crop protection chemicals		kilograms	
Fuel		Litters	
Labor		number	
Paid salary for ag.		xxx	xxx

Workers			
Other			
Please indicate Other _____			

2.14. Which assistance you received last year for purchasing agricultural inputs and who provided this assistance.

Type of assistance	**Received last year**		**Who provided assistance**
	Yes	**No**	
Information about agricultural inputs suppliers			
Information about use of agricultural inputs			
Agricultural inputs received			
Other			
Please indicate Other _____			

2.15. Please indicate methods that you used last year for farm management:

Type of farm management	**Used last year**	
	Yes	**No**
Farm operation planning and products marketing (plan was created in writing or in electronic version)		
Documentation management for producing and		

marketing of ag. products (documentation management have been done in writing or in electronic version)		
Analysis of agricultural production (in writing or electronic version)		
Calculation of Gross Income (in writing or electronic version)		
Documentation for used labor (in writing or electronic version)		
Received consultation for increasing agricultural production		
Developed Contracts for the season workers and/or product marketing		
Developed Contracts for purchasing agricultural inputs		

2.16. Have you received a credit for the farming purpose last year?

Answer	**Please check one**
Yes	
No	

2.16.1. If "Yes", please indicate below:

Credit characteristics	Units	Quantity
Total amount of your credit for farming	hryvna	
Annual interest rate	%	
Length of the credit	month	

2.16.2. If "Yes", please indicate credit source below:

Credit source	**Used last year**	
	Yes	**No**
Bank		
Credit Association		
Agro business company		
Borrowed from family member		
Other		
Please indicate Other _____		

2.16.3. If "No", please indicate why you could not obtain farming credit below:

Reason(s) for preventing to obtain farming credit	**Please indicate one**	
	Yes	**No**
Do not have Colorado		
Did not need it		
Did not want to take a risk		

Very high Interest rate		
Very short period to pay off		
Very high minimum amount		
Very high amount to pay off		
Very complicated process to apply		
Long period to be approved		
Other		
Please indicate Other _____		

APPENDIX D.
INSTITUTIONAL REVIEW BOARD APPROVAL

ACTION ON EXEMPTION APPROVAL REQUEST

Institutional Review Board
Dr. Robert Mathews, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu | lsu.edu/irb

TO: Viacheslav Sereda
HREWD

FROM: Robert C. Mathews
Chair, Institutional Review Board

DATE: April 22, 2014
RE: **IRB#** E8779

TITLE: Factors influence on improving agricultural production of Ukrainian private farmers

New Protocol/Modification/Continuation: New Protocol

Review Date: 4/22/2014

Approved X **Disapproved**

Approval Date: 4/22/2014 **Approval Expiration Date:** 4/21/2017

Exemption Category/Paragraph: 4

Signed Consent Waived?: Yes

Re-review frequency: (three years unless otherwise stated)

LSU Proposal Number (if applicable):

Protocol Matches Scope of Work in Grant proposal: (if applicable)

By: Robert C. Mathews, Chairman

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. SPECIAL NOTE:

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at http://www.lsu.edu/irb*

VITA

Viacheslav L. Sereda was born in small town, Khmelnik in Ukraine, in 1971. He moved in 1974 with his parent into the Vinnitsa city at the middle part of Ukraine. He finished high school in 1989 and enrolled at National Agrarian University in Kiev. During his agricultural engineering program, he participated in international student exchange program. During this exchange program, he attendant Iowa State University for one semester and after successful completion abroad program, he came back and in 1994 graduated from National Agrarian University with Specialist Degree in Agricultural Engineering. In the same year, he started International program coordinator position at the same university where he met and discussed with former Chancellor of Louisiana Agricultural Center possibilities to enroll into the graduate program at Louisiana State University. In September of 1995, he came to the United States and started his master program at the Food Science Department. Upon his master degree completion, he moved back to his home country, Ukraine and started program coordinator position with USAID Project between Louisiana Agricultural Center and Ukrainian partners including World Laboratory, Ukraine Branch, Vinnitsa State Agricultural University. In September of 2000, he started his doctoral program at The School of Human Resource Education And Workforce Development.

In August of 2004, he started research analyst position at the Louisiana Department of Education. During his one and the haft year of service at the accountability unit, he received different awards for innovation and school assistance during Hurricane Katrina. In March of 2006, he was transferred into the Recovery School District and in May of the same year received position of Technology Director, Recovery School District.

He left New Orleans, Recovery School District in June of 2008 and started his new position, Technology Director with Louisiana Board of Ethics.